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ADAMITE

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KOPPERS
BY-PRODUCT COKE OVENS

The first Koppers by-product coke plant in America was built at Joliet, Ill., in 1908. At that time, approximately FOUR MILLION tons of coal per annum were carbonized in by-product coke ovens. Today, approximately SIXTY MILLION tons of coal per annum are carbonized in by-product ovens.

Koppers ovens in operation today—totalling over six thousand four hundred—have a carbonizing capacity of FORTY-TWO MILLION tons of coal per annum. In other words, SEVENTY-FIVE PER CENT of the increased by-product coking capacity is in Koppers ovens.

The development in the method of manufacturing coke was an economic one—just as logical as the development in the methods of manufacturing iron and steel; and this astounding growth of the Koppers by-product oven was the recognition by the iron and steel industry generally that the Koppers system of by-product coking and by-product recovery was the perfecting of this development to the highest point of efficiency.

OUTSTANDING FEATURES OF THE KOPPERS OVEN ARE:

First: Strong construction—which means long life and low repair costs.

Second: Perfect heat control and distribution—insuring the most flexible operation and the best results in coke quality and quantity of by-products.

Third: Ability to heat ovens either with coke oven gas or with outside gases, such as producer gas, water gas or blast furnace gas—thus releasing all the rich coke oven gas for use elsewhere. This principle is embodied in the Koppers "Combination" Oven.

Fourth: Accessibility of all parts of oven for inspection, thus making it easy to correct any irregularities which might affect operating results.

Fifth: Simplicity of operation—resulting in low labor costs.

Sixth: Ability to make satisfactory blast furnace and foundry coke from the widest range of coals.

THE KOPPERS COMPANY
PITTSBURGH, PA.

DESIGNERS AND BUILDERS OF BY-PRODUCT COKE AND GAS OVEN PLANTS

Vol. LXVIII THE IRON TRADE REVIEW No. 8
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Cleveland, February 24, 1921

Market Readjustment Waiting

Price Spread Between Independent Producers and Steel Corporation Grows—Further Declaration by Leading Producer Expected Soon as Its Operations Are Declining—New Business Is Sluggish—Automotive Companies Release Some Tonnage

COMPLETE readjustment of the iron and steel market to a stabilized basis manifestly has not yet been accomplished and conditions remain decidedly unsettled. The cleavage between the position on prices of the independent companies and that of the Steel corporation has been rendered more pronounced by a further descent of some of the schedules of the former producers. Competitive prices as much as $9 to $11 per ton below the maximum figures now being maintained by the largest producers, have appeared the past week and this spread is growing steadily. That the Steel corporation must meet this situation before many days is a matter of common market opinion. In some quarters it is thought such action is not far distant but authoritative word to that effect is lacking.

Declining plant operations of the Steel corporation are being given close attention in the general industry because of their bearing on the question of prices by the leading producer. The Illinois Steel Co. which recently was running at 85 per cent of ingot capacity is down to 65 per cent this week and has put out two blast furnaces. The Carnegie Steel Co. is pursuing a similar course. Its steelworks operations are lower at 70 to 75 per cent and five blast furnaces recently have been added to the idle list. The Columbus plant usually one of the first to feel any retrenchment policy was shut down indefinitely Feb. 19, and the Sharon works also is inoperative this week. Keeping step with the reduced demand for coke from Steel corporation blast furnaces, the H. C. Frick Coke Co. has put out five oven operations in the Connellsville region.

New Orders Are Light

Plainly the response of steel buyers to the market's lower price basis created by the independent mills has been disappointing to date. Only a limited amount of new business has been brought out and this has been modified further by hold-ups of former or prospective orders by uncertain customers. Bookings by the Midvale Steel & Ordnance Co. the past two weeks have been at the rate of 40 per cent of capacity of its Johnstown works, its leading producing unit. Sheetmakers in the Mahoning valley despite their willingness to make substantial price cuts are operating only at 5 per cent of capacity this week, the lowest point in years.

The Ford Motor Co. is releasing some sizable tonnages to the mills to serve a schedule of 47,000 cars in February and 60,000 in March.

Soft Prices Prevail

Expected price readjustments in finished steel are going forward to conform with reductions previously established in related products. Sheets have dipped more plainly to a level of 4.10c Pittsburgh on black, 5.35c on galvanized and 3.20c on blue annealed, or $5 to $9 per ton. Plates have developed a new minimum with quotations at New York of 2.10c Pittsburgh and sales in several directions at 2.15c. More steel bar sales have been closed at 2.00c Pittsburgh. Structural shapes are selling openly at 2.15c and shafting, hoops and bands, and hot and cold-rolled strip have been sold or offered $5 per ton lower. One tin plate mill has made concessions of $5 per ton.

THE IRON TRADE REVIEW's market composite this week is $47.50. This compares with $48.36 last week, $51.73 in January, and $53.53 in December.

Present consumption of pig iron by foundries in leading Ohio centers is from 20 to 25 per cent of capacity according to a recent survey made by furnace interests. This same basis has been found to apply elsewhere. The iron market still is drifting and price declines continue. Further sales of basic have been made at $25 valley. Mahoning valley steelmakers closed this week at that level about 5000 tons. Foundry grades have been sold at $27 valley, $28 eastern Pennsylvania furnace and $26.50 Birmingham.

Market Down in Europe

Conditions in the European markets are similar to those now in force in this country. The depression there is extending under conditions of the severest competition. Many British blast furnaces and steelworks are idle. Wages are being reduced for the first time in several years. Prices in France, Belgium and Germany are falling and the readjustment process appears to be in full sway.

THE IRON TRADE REVIEW

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Taxes, Tariff and Politics

CHIEF among the problems which will confront President Harding after March 4 are those of tax revision and the tariff. At this time it appears tax matters will be given the right-of-way. President Harding is pledged to revise, if not repeal, the excess profits tax, to modify the income tax and to eliminate the tax on freight charges and passenger fares. There is some semblance of unanimity on the tax problem, and once a substitute for the excess profits tax has been found, the greatest obstacle will have been surmounted.

But the tariff problem will not be solved so simply. There is a division of opinion within the ranking party, which will have an overwhelming majority in both houses of congress after March 4, as to the feasibility of attempting to enact any permanent tariff legislation this year. It is announced that the measure will seek to level production costs here and abroad.

The majority members of the committee concede the series of tariff hearings in progress since the first week of January has proved disappointing. Witnesses did not show with any degree of accuracy the production costs of their foreign competitors. Meanwhile exchange fluctuates daily. Still another factor is the instability of ocean freights. Domestically, the problems are equally complicated, production costs are falling, and January figures are misleading by February.

Experience reveals that from nine to ten months elapse from the time a tariff bill leaves the house ways and means committee until it finds its way to the White House for signature. How then, it is asked by members of congress, can an equitable tariff be drafted in March and April, to apply in September or October, and thence on? To enact a measure that will protect American industry from ruinous, foreign competition and at the same time not increase prices within the United States, is the task cut out for the next administration.

The iron and steel industry not alone is interested in Schedule C, which covers metals and manufactures of metals, and the free list. Every other industry's reaction to the proposed tariff legislation will have its effect upon the market for iron, steel and other metals. Iron and steel producers may as well now dedicate themselves to a spring and summer of "watchful waiting" on taxes and tariff and realize that no matter how many industrial diversions are staged outside of Washington, the three-ring attraction for the whole nation for some time will be taxes, tariff and politics.

Eliminating Industrial Waste

A MOVEMENT which undoubtedly will have an important bearing upon the future industrial activity with the United States was given impetus last week at a meeting at Syracuse, N. Y., when machinery was perfected for making a great national assay of waste, in which from 100,000 to 200,000 engineers will attempt to locate the weaknesses in the country's production system. At the Syracuse meeting it was announced that a preliminary survey already has been organized and that this will result in the investigation of various elements contributing to industrial loss, including labor conflict, decrease in individual productivity, lack of co-ordination, etc. The investigation is being undertaken by a committee of well known engineers under the direction of Herbert Hoover.

The work of this committee will be nation-wide and is decribed as the most ambitious movement in the direction of solving economic problems ever undertaken by American engineers. It is the intention of the committee in its capacity as one of the functioning departments of the Federated American Engineering societies to enlist the services of the engineers of the

country through the agency of the hundreds of national and local engineering societies. It is proposed to organize this vast force of technical men on a territorial basis, each state having an engineering organization, the American Engineering council serving as the executive organ.

Although the work briefly outlined above involves a tremendous amount of effort and requires effective organizing ability, persons who are familiar with the work of Mr. Hoover and his associates realize that they will not stop at anything short of success. Their effort to extend the scope of the American engineer into the field of public service is in sharp contrast to the conception of the sphere of the engineer held 10 or 15 years ago. From an academic individual, closely hedged in by tradition and professional narrow-mindedness, the engineer seems at last to have emerged from his obscurity into the light of day where his capacity for clear analysis, organization and leadership will have an opportunity to assert itself.

The officers of the Federated American Engineering societies are to be congratulated for having chosen the elimination of industrial waste as one of the first big problems to be solved. It would be difficult to conceive a greater service to industrial America than the co-ordinating of the various manufacturing and industrial service agencies into units which will work in harmony and whose activities will go on unhindered by duplication of effort, strife, inefficiency and other forms of preventable waste.

Blast Furnace Activity a Barometer

DURING periods of general business depression, blast furnace activities and the production of pig iron serve as fairly reliable barometers of the seriousness of conditions. Of the two, furnace operations perhaps are the more accurate, for the monthly figures of output usually show a lagging reflection of stack changes, because of the varying dates these suspensions occur.

On the last day of September, 317 furnaces were in operation, of which 130 were merchant and 187 nonmerchant, the total being the highest since January, 1919, when 330 were in blast. By Jan. 31, the number of active stacks had fallen to 184, of which 48 were merchant and 136 nonmerchant, the total being the lowest since September, 1919, the first month of the steel strike. In other words, on the last day of January only 58 per cent of the stacks operating in September were active. During October, 14 merchant and 13 nonmerchant stacks were blown out or banked; in November, 21 merchant and 14 nonmerchant; in December, 37 merchant and 16 nonmerchant; and in January, 10 merchant and 8 nonmerchant, showing that the curtailment gained momentum each succeeding month until the peak was reached in December. It is significant that the merchant curtailment, while starting out almost parallel to nonmerchant, gained impetus faster than the latter until the high point of curtailment was reached. Then both resumed a practically equal basis of curtailment.

In five months' time 82 merchant furnaces have become inactive, while but 51 nonmerchant furnaces have gone out of blast. Compared with the September activities, this is a loss of 63 per cent in merchant and 27 per cent in nonmerchant stacks. Stated in another way, on Jan. 31, 37 per cent of the merchant stacks and 73 per cent of the nonmerchant stacks were operating. The proportionate loss of merchant stacks is more than double that of the nonmerchant class. From September, the ratio of merchant stacks to nonmerchant dropped from 69 per cent to 35 per cent.

The relative sustentation of the steel industry as against foundry operations without doubt, is responsible for the superior showing of nonmerchant furnaces. Demand for merchant iron has fallen sharply while the consumption of tonnages from the steelworks furnaces has not suffered so severely. Independent steel mills are feeling the depression but the Steel corporation, because of its large unfilled tonnages, has been operating at approximately 85 per cent of capacity and as a result has shown improvement in the operations of its blast furnaces. On Sept. 30, the corporation was operating 91 furnaces while on Jan. 31, the number had increased to 99. How long the corporation will be able to maintain this record is a question. Already, it is beginning to show signs of entering upon a period of blast furnace curtailment.

Financing Export Sales

NOTHING could have been more effective for the support of foreign trade than the recent announcement of E. H. Gary that the United States Steel Corp., had extended credit for $20,000,000 to foreign buyers.

The Consolidated Steel Corp., the export organization of a number of the independent mills, likewise has extended credits to foreign customers under similar circumstances. The "unattached" export house has been able to do no more than use its own capital and it has been hard pressed by the adverse exchange rotes and the worldwide business slump.

Success in export trade today depends upon the ability to finance the foreign buyer. Now that the banking community is attempting to co-ordinate all the efforts of those who are willing to do foreign financing, it is reasonable to suppose that not much difficulty will be experienced in promoting organizations under the Edge act. Bankers alone cannot supply the capital for a foreign finance corporation. To be successful, it must be backed by the bank, the trader and the producer in direct proportion to the benefits each may expect to derive.

Iron and Steel Prices

CORRECTED TO WEDNESDAY NOON—SCRAP, WAREHOUSE, ORE AND OTHER PRICES ON PAGES 586 AND 590

Pig Iron

Bessemer, valley	$27.00
Bessemer, Pittsburgh	28.96
Basic valley	25.00
Basic, Pittsburgh	26.96
Basic, Buffalo	30.00 to 32.00
Basic, delivered, eastern Pa.	28.50 to 29.00
Malleable, valley	27.00 to 28.00
Malleable, Pittsburgh	28.96 to 29.96
Malleable, Chicago	29.00 to 30.50
Malleable, Buffalo furnace	30.50 to 32.50
Malleable, del., eastern Pa.	30.90 to 31.40

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.25
No. 2 Southern foundry	1.75 to 2.25
No. 2X Eastern and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 and up
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern del. Phila.	$30.54 to 31.54
No. 1X, Buffalo	33.00 to 34.00
No. 2 foundry, valley	27.00 to 28.00
No. 2 foundry, Pittsburgh	28.96 to 29.96
No. 2 foundry, Buffalo	30.00 to 32.00
No. 2 foundry, Chicago	28.50 to 30.00
No. 2 foundry, Ironton furnace	28.00 to 29.00
No. 2 foundry, Cleveland	28.00 to 29.00
No. 2X, eastern del. Phila.	29.54 to 30.54
No. 2X, eastern N. J., tidewater	29.46 to 30.54
No. 2X, eastern del. Boston	31.06 to 34.06
No. 2X foundry, Buffalo fur.	31.25 to 33.25
No. 2X, Buffalo del. Boston	33.71 to 34.71
No. 2 foundry del. Phila.	28.54 to 29.54
No. 2 foundry, N. J., tidewater	28.46 to 29.54
No. 2 southern, Birmingham	26.50 to 27.50
No. 2 southern, Cincinnati	31.00 to 32.00
No. 2 southern, Chicago	33.16 to 34.16
No. 2 southern, Philadelphia	35.16 to 36.16
No. 2 southern, Cleveland	33.16 to 34.16
No. 2 southern, Boston	33.65 to 35.65
No. 2 southern, St. Louis	32.22 to 33.22
No. 2X, Virginia furnace	31.25
No. 2X, Virginia, Philadelphia	36.99
No. 2X, Virginia, Jersey City	37.41
No 2X, Virginia, Boston	35.83 to 37.83
Gray forge, eastern Pa.	29.75
Gray forge, valley, Pitts.	26.96 to 27.96
Low phos., standard, valley	43.00 to 44.00
Low phos., standard, Phila.	46.82
Low phos., Lebanon furnace	40.00
Charcoal, Superior, base, Chi.	38.50

Silvery Iron
8 per cent base at furnace

Jackson County, Ohio	$43.50
Tennessee, Chicago delivery	43.03
Ohio brands, Chicago	48.82

Bessemer Ferrosilicon
Jackson County, Ohio, furnace

10 per cent	$53.00
11 per cent	56.30
12 per cent	59.60

Coke

Connellsville furnace	$4.50 to 5.00
Connellsville foundry	6.00 to 6.50
Pocahontas furnace	8.50
Pocahontas foundry	9.00 to 10.00
New River furnace	7.00 to 8.00
New River foundry	9.00 to 11.00
Wise county furnace	7.50 to 9.00
Wise county foundry	8.00 to 9.00

Ferroalloys

Ferromanganese, 80 per cent, delivered, domestic metal	$90.00 to 95.00
Ferromanganese, 80 per cent, English, c.i.f. Atlantic port	95.00 to 100.00
Spiegel, 18 to 22 per cent furnace spot	34.00 to 37.00
Ferrosilicon, 50 per cent, contract delivered	92.00 to 95.00
Ferrosilicon, 50 per cent, spot delivered	76.00 to 90.00
Ferrotungsten, standard, per pound contained	55.00c to 60.00c
Ferrochrome, 60 to 70 chromium, 6 to 8 carbon, per pound contained, maker's plant	16.00c to 16.50c
Imported ferrochrome, 6 to 8 per cent carbon	nominal
Ferrovanadium, 30 to 40 per cent per pound estimated, according to analysis	5.00 to 6.75
Ferro carbon-titanium, carloads, producers plant, per net ton	$200.00

Semifinished Material

BILLETS AND BLOOMS
(4 x 4-inch)

Open-hearth, Pittsburgh	$38.50 to 42.00
Open-hearth, Youngstown	38.50 to 42.00
Open-hearth, Philadelphia	49.24
Bessemer, Pittsburgh	38.50 to 42.00
Bessemer, Youngstown	38.50 to 42.00
Forging, Pittsburgh	45.00 to 51.00
Forging, Philadelphia	54.24 to 55.74

SHEET BARS

Open-hearth, Pittsburgh	$42.00
Open-hearth, Youngstown	42.00
Bessemer, Pittsburgh	42.00
Bessemer, Youngstown	42.00

SLABS

Pittsburgh and Youngstown	$38.50 to 42.00

WIRE RODS AND SKELP

Wire rods, Pittsburgh	$52.00 to 57.00
Grooved skelp, Pittsburgh	2.35c to 2.45c
Universal skelp, Pittsburgh	2.45c to 2.50c
Sheared skelp, Pittsburgh	2.55c to 2.65c

Shapes, Plates and Bars

Structural shapes, Pittsburgh	2.15c to 2.45c
Structural shapes, Phila.	2.50c to 2.80c
Structural shapes, New York	2.53c to 2.83c
Structural shapes, Chicago	2.53c to 2.83c
Tank plates, Pittsburgh	2.15c to 2.65c
Tank plates, Chicago	2.53c to 3.03c
Tank plates, Philadelphia	2.45c to 3.00c
Tank plates, New York	2.48c to 3.03c
Bars, soft steel, Pittsburgh	2.10c to 2.35c
Bars, soft steel, Chicago	2.48c to 2.73c
Bars, soft steel, New York	2.38c to 2.73c
Bars, soft steel, Philadelphia	2.35c to 2.70c
Bar iron, common, Phila.	2.70c
Bar iron, common, Chicago	2.68c
Bar iron, common, Cleveland	3.75c to 4.00c
Bar iron, common, New York	2.73c
Bar iron, common, Pittsburgh	3.13c
Hard steel bars, Chicago	2.50c to 2.65c

Rails, Track Material

Standard bessemer rails, mill	$45.00
Standard open-hearth rails, mill	47.00
Relaying rails, light, St. Louis	35.00 to 40.00
Relaying rails, Pittsburgh	43.00 to 46.00
Angle bars, Pittsburgh base	2.45c
Angle bars, Chicago base	2.75c
Light rails, 25 to 45, mills	2.45c to 2.50c
Spikes, railroad, Pittsburgh	3.65c
Spikes, railroad, Chicago	4.03c
Track bolts, Pittsburgh	4.60c to 5.50c
Track bolts, Chicago	4.98c to 6.38c
Tie plates, Chicago	3.00c to 3.50c

Wire Products

(100 lbs. to jobbers, carloads; retailers, 10c more)

Wire nails, Pittsburgh	$3.10 to 3.25
Plain wire, Pittsburgh	3.00 to 3.25
Galvanized wire, Pittsburgh	3.70 to 3.95
Barbed wire, painted, Phila.	3.15 to 3.40
Barbed wire, galv., Pitts.	3.85 to 4.10
Polished staples, Pittsburgh	3.15 to 3.40
Galvanized staples, Pitts.	3.85 to 4.10
Coated nails per count keg, Pitts.	2.85 to 3.35

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Chain, Piling, Strip Steel

Chain, 1 in. proof coil, Pitts.	6.75c
Sheet piling base, Pitts.	2.05c to 2.55c

Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100-inch and heavier, base per 100 pounds 6.00c to 6.25c

Sheets

SHEET MILL BLACK

No. 28, open-hearth, Pitts.	4.10c to 4.35c
No. 28, bessemer, Pittsburgh	4.10c to 4.35c
No. 28, open-hearth, Chicago	4.48c to 4.73c
No. 28, open-hearth, Phila.	4.35c to 4.70c

TIN MILL BLACK

No. 28, open-hearth, Pitts.	4.10c to 4.35c
No. 28, bessemer, Pittsburgh	4.10c to 4.35c

GALVANIZED

No. 28, open-hearth, Pitts.	5.35c to 5.70c
No. 28, bessemer, Pittsburgh	5.35c to 5.70c
No. 28, open-hearth, Chicago	5.73c to 6.08c
No. 28, open-hearth, Phila.	5.65c to 6.05c

BLUE ANNEALED

No. 10, open-hearth, Pitts.	3.20c to 3.55c
No. 10, bessemer, Pittsburgh	3.20c to 3.55c
No. 10, open-hearth, Chicago	3.58c to 3.93c
No. 10, open-hearth, Phila.	3.55c to 3.90c

Tin Plate

(Per 100 lb. box)

Tin plate, coke base, Pittsburgh	$7.00

Iron and Steel Pipe

Base Discounts Pittsburgh to Jobbers Carloads

	Black	Galv.
⅜ to 3 in., butt steel	57½	44
¼ to 1½ in., butt iron	34½ to 24½	18½ to 8½

Full pipe schedule page 590.

Boiler Tubes

Steel, 3½ to 4½ inches, c. l.	40½ off
Iron, 3½ to 4½ inches, c. l.	12 off

Cast Iron Water Pipe

Without War Freight Tax
Class B Pipe

Four-inch, Chicago	69.10
Six-inch and over, Chicago	64.10
Four-inch, New York	73.30
Six-inch and over, New York	63.30
Four-inch, Birmingham	60.00
Six-inch and over, Birmingham	55.00
Three-inch, Birmingham	70.00

Class A pipe is $4 higher than Class B

Hoops, Bands, Shafting

Hoops, Pittsburgh	2.80c to 3.05c
Bands, Pittsburgh	2.80c to 3.05c
Hot rolled strip steel, Pittsburgh stamping quality	3.00c to 3.30c
Cold finished steel bars, Pittsburgh base	3.25c to 3.60c

Rivets

Structural rivets, Pittsburgh	3.90c to 4.00c
Boiler rivets, Pittsburgh	4.00c to 4.10c
Rivets, ⅞ in. and smaller, Pittsburgh	60 and 10 off

Nuts and Bolts

(Prices f.o.b. Pittsburgh)

CARRIAGE BOLTS
(⅜ x 6 inches, smaller and shorter)

Rolled thread	60 off
Cut thread	50-10 off
Larger and longer	50-10 off

MACHINE BOLTS
(⅜ x 4 inches, hot pressed nuts)

Rolled thread	60-10-10 off
Cut thread	60-10 off
Larger and longer	60 off
Plow bolts Nos. 1, 2 and 3 heads	50-10-5 off
Other style heads	50-10-5+20%
Stove bolts in packages	75-10-10 off
Stove bolts in bulk	75-10-10-2½ off
Cold pressed semifinished hexagon nuts ⅜ in. and larger	70-10 off
Cold pressed semifinished hexagon nuts ⅞ in. and smaller	80 off
Gimlet and cone point lag screws	65 off

NUTS
(Up to 1¼ and 1½ inches inclusive)

Hot pressed, square blank	$3.25 off
Hot pressed, square tapped	3.00 off
Hot pressed, hexagon blank	3.25 off
Hot pressed, hexagon tapped	3.00 off
Cold pressed, square tapped	2.85 off
Cold pressed, square blank	3.10 off
Cold pressed, hexagon tapped	2.85 off
*Cold pressed, hexagon blank	3.10 off

Prices Present and Past

Representative market figures yesterday, one month ago, three months ago and one year ago

Prices given in this table are those ruling on the largest percentage of sales, at the dates named

	Prices Feb. 23, 1921	Average prices Jan., 1921	Nov., 1920	Feb., 1920
PIG IRON—				
Bessemer, valley, del., Pittsburgh	$28.96	$33.96	$42.35	$43.15
Basic, valley, del., Pittsburgh...	26.96	31.29	39.46	43.65
*No. 2 Foundry, val. del. Pitts..	28.96	32.90	42.96	42.40
*No. 2 Foundry, Chicago.....	28.00	32.75	42.75	42.25
Lake Superior charcoal, Chicago.	38.50	40.25	58.50	55.65
Malleable, valley	27.00	32.00	40.35	43.00
Malleable, Chicago	28.50	33.25	43.00	42.75
*Southern, No. 2, Birmingham...	27.00	33.00	39.50	40.00
*Southern Ohio, No. 2, Ironton.	28.00	34.60	44.00	43.00
Basic eastern del. eastern Pa....	28.75	33.40	44.55	40.50
**No. 2X, Virginia furnace.....	31.25	34.50	45.75	42.75
**No. 2X, eastern del., Phila....	30.00	35.00	46.75	45.00
Gray forge val., del. Pittsburgh..	27.96	31.96	42.21	41.40
Ferromanganese, 80 per cent, del.	92.50	101.25	153.00	160.00
SEMIFINISHED MATERIAL—				
Sheet bars, bessemer, Pitts.....	42.00	47.00	56.25	65.00
Sheet bars, open-hearth, Pitts....	42.00	47.00	56.25	65.00
Billets, bessemer, Pittsburgh....	38.50	43.50	52.50	61.25
Billets, open-hearth, Pittsburgh..	38.50	43.50	52.50	61.25
FINISHED MATERIAL—				
Steel bars, Pittsburgh.....	2.00c	2.35	3.00	3.85
Steel bars, Chicago.....	2.38c	2.73	3.16	2.62

	Prices Feb. 23, 1921	Average prices Jan., 1921	Nov., 1920	Feb., 1920
FINISHED MATERIAL—Continued				
Iron bars, Philadelphia.....	$2.70	$3.19	$4.40	$3.75
Iron bars, Chicago mill.....	2.63	2.76	3.75	3.44
Beams, Pittsburgh	2.20	2.45	3.00	3.15
Beams, Philadelphia	2.60	2.80	3.40	3.75
Beams, Chicago	2.58	2.83	3.08	2.72
Tank plates, Pittsburgh.....	2.15	2.65	3.00	3.70
Tank plates, Chicago.....	2.53	3.03	3.38	2.92
Tank plates, Philadelphia.....	2.60	3.00	3.55	4.25
Sheets, blk., No. 28, Pittsburgh..	4.10	4.35	6.05	6.00
Sheets, blue anl., No. 10, Pitts...	3.20	3.55	4.95	5.50
Sheets, galv., No. 28, Pittsburgh.	5.35	5.70	7.35	7.00
Wire nails, Pittsburgh.....	3.25	3.25	4.00	4.20
COKE—				
Connellsville furnace, ovens.....	4.75	5.15	8.35	6.00
Connellsville foundry, ovens.....	6.25	6.50	9.35	7.00
OLD MATERIAL—				
Heavy melting steel, Pittsburgh..	15.00	15.00	24.00	28.15
Heavy melting steel, eastern Pa..	14.50	15.00	23.80	25.75
Heavy melting steel, Chicago....	15.00	15.25	18.50	25.05
No. 1 wrought, eastern Pa.....	20.50	20.50	29.85	36.15
No. 1 wrought, Chicago.....	15.50	15.65	19.55	30.75
Rerolling rails, Chicago.....	15.25	15.80	24.15	34.65

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon. †Tidewater.

Iron Consumption At Low Ebb

Foundry Centers Show 20 to 25 Per Cent Operations—Buyers Display Little Interest—Downward Trend of Prices Unchecked—Steelmakers Sell Basic at $25—Southern Iron Touches $26.50 Birmingham—More Furnaces Out

Chicago, Feb. 22.—Weakness continues evident in the market for pig iron in the Chicago district with quotations slipping gradually in the absence of demand. An important seller is quoting $29 to $30, Chicago, for 1.75 to 2.25 silicon and inasmuch as only small lots have appeared, these prices have been given no real test. It seems likely a lower figure would be developed an attractive offering. It is evident that resale lots have been pretty well absorbed and brokers now know of little iron of this sort, where formerly they had much from which to choose. A resale lot of 250 tons was transferred recently in this district at $29, Chicago.

Southern iron seems to have definitely reached $27.50, Birmingham, with two important makers quoting this level. A Tennessee maker of silveries is offering 8 per cent at $43.03, delivered, Chicago. This is $5 under competing brands in the Jackson county, Ohio, district.

A large sale of basic iron by a Chicago steelmaker to a steel plant in Ohio river territory, involving 20,000 tons at $25 furnace, has just come to light This sale was made when the market in the district and elsewhere was well above $25. At that time the market was above $30.

No further curtailment of merchant capacity has taken place, the only change in production being the loss of two steelwork stacks blown out by the Illinois Steel Co. Another stack has been changed over from pig iron to ferromanganese.

Foundry Melt Is Low

Cleveland, Feb. 22.—General foundry operations in Cleveland, Toledo, Dayton, Springfield, and other Ohio centers now are approximately 20 to 25 per cent of capacity according to surveys which have been made in these cities recently by pig iron producers individually. In most cases it was found that these consumers at the present melting rate, have sufficient iron on hand to fill their needs practically to the end of the year. Furthermore a number of these plants have some tonnage on order with the furnaces which yet is to be shipped. The conclusion which the furnace interests have reached from these surveys is that buying if iron is likely to remain extremely restricted for an indefinite period unless trade conditions show a substantial betterment. A few more negotiations for iron are apparent but sales remain very light. A northern Ohio consumer is figuring on 500 tons of malleable and a Cleveland shop of the same character is reported in the market for some tonnage. The recent inquiry for 1000 tons of malleable put out by a Columbus buyer and which was offered to makers at $25 valley and declined, still is unplaced. A Toledo melter put out an inquiry for 1000 tons of foundry iron for second quarter and for 400 tons of higher silicon metal for early shipment but bought only a small amount of the latter. The second quarter inquiry apparently was put out merely to test the market. The American Radiator Co. has inquired for 1000 tons of foundry iron for Detroit and 500 tons for Titusville, Pa. The price situation is little changed. On foundry iron $28 furnace or valley appears to be the going price, though Cleveland makers have not yet named so low on local business, quoting this figure only for

Composite Market Average

Representing the Combined Average Prices Per Ton of Fourteen Leading Iron and Steel Products. Yesterday, One Week, One Month, Three Months, One Year and Seven Years Ago

February 23, 1921	February 16, 1921	January, 1921	November, 1920	February, 1920	February, 1914
$47.10	$48.36	$51.73	$63.75	$65.63	$23.52

outside shipment. One producer sold 200 to 300 tons in the week, the last lots at the $28 furnace base. Shipments are little better but still poor. One producer with greatly restricted capacity in blast, is shipping only 50 per cent of output. The McKinney Steel Co. has put out another furnace in this city, leaving but one stack operating out of a group of four.

Large Consumers Sound Market

Cincinnati, Feb. 22.—The turn of the tide in pig iron buying is believed to be approaching in that, during the past few days some new inquiries have appeared, which, while in most instances are somewhat indefinite as to tonnage and delivery, are said to come from large consumers. Present buying activity is light, however, beyond the limited small lot sales and a purchase here and these from 100 to 500 tons. These sales are reported at soft prices. The market appears to have thoroughly broken under the $30 base, some Southern Ohio producers having come out with open quotations of $29.50, furnace, for No. 2 foundry (1.75 to 2.25 silicon) Southern iron is quiet and the market is weak. A southern consumer who recently bought a considerable tonnage is said to have increased his order by 1000 tons, getting the additional consignment at a further slight concession. It is estimated that the entire tonnage will average about $28.50, Birmingham. The open price on southern iron now is $27.50 base Birmingham and $26.50 has been done in some cases the past week with consumers in Alabama territory.

Report New Low Prices

Boston, Feb. 21.—The rate of melt among New England foundries continues on approximately an even level, but the pig iron market is undergoing a gradual change. New low prices have been reached and it is evident from the attitude of furnaces that any sizable tonnage offered at present would be able to attract decidedly favorable prices. In eastern Pennsylvania but 8 out of 25 merchant furnaces are in blast. In Virginia 3 out of 17 furnaces are active. The Low Moor Iron Co., Low Moor, Va., has one furnace running light and producing high silicon iron. In fact, the run of silicon is of such a nature that the furnace is able to quote 2.75 to 3.25 silicon iron at the same price as for the base grade. The Virginia Iron, Coal & Coke Co. has one furnace making about 4000 tons a month and is shipping three-quarters of this amount. Southern furnaces, on account of the freight rate, form a small factor in the present New England market. Buffalo furnaces continue to quote higher delivered prices in New England than the eastern Pennsylvania makers but on competitive business producers have named unusually low prices. An indication of the price situation in New England is clearly shown by the results of the Sullivan Machine Co., Claremont, N. H., inquiry, which was closed during the past week. Nearly every dealer and furnace agent in New England made a special effort to secure all or part of the 300-ton order. This order, for prompt delivery, was split into three lots. The first, 100 tons of malleable, was placed at approximately $32, delivered; the second lot, 100 tons of No. 2X (2.25 to 2.75 silicon) eastern Pennsylvania iron, was placed at $27, furnace, or $31.06, delivered, or at least, $26, base, and on the usual differentials, $25.75 which is lower than anything previously reported in this district.

The third lot of No. 1X (2.75 to 3.25 silicon) is reported as placed with an eastern Pennsylvania interest at $30, furnace, or $34.06, delivered, but this report is not confirmed. Other reports place it with a Virginia interest at from $28 to $30, furnace. From quotations submitted which did not secure the business the price is known to have been exceedingly low and not over $31, furnace, which with the usual differentials means a $28, base. The Amoskeag Co., Manchester, N. H., also bought 300 tons during the week at a reported $28 base price. It is generally conceded from these sales and other small sales made during the week that prices at present in New England are on the basis of $28 to $29, eastern Pennsylvania furnaces, or $32 to $33, delivered. A western Massachusetts consumer bought between 100 and 200 tons of resale No. 2X iron at $31, delivered.

Prices Continue Descent

New York, Feb. 21.—Demand for pig iron has improved somewhat and at least 3000 tons of foundry iron have been sold during the past week for prompt shipment to consumers in this district. Prices done on some of this business were considerably lower than the $28, eastern Pennsylvania furnace price on 1.75 to 2.25 silicon which previously had been the market minimum. Offers of 2.25 to 2.75 silicon at $28.50, eastern Pennsylvania furnace, in some cases, were accepted and in others failed to get the business, and it is known that one tonnage of considerable size was booked by a furnace in another district for shipment to an eastern melter at lower than the equivalent of $28, eastern Pennsylvania furnace, for the 2.25 to 2.75 silicon grade. Just what is the market minimum at present is not readily apparent, but the above prices seem to represent the present market here. Some Buffalo 2.25 to 2.75 silicon has been offered at resale at $29, furnace. Gray forge has been offered at first hand at $25.50 Buffalo. An interesting transaction during the past week was the sale of a moderate tonnage of foundry iron to a South American buyer in competition with Scotch iron. The iron involved was disposed of at resale and the reseller, in order to outdo the Scotch price, had to accept a price about $2 to $3 lower than the furnace price at present.

Eastern Prices Work Lower.

Philadelphia, Feb. 22.—Pig iron sales in this district the past week have consisted mostly of foundry run for prompt shipment and the total was small. Prices generally are lower. The market is quotable at $27.50 to $28.00 eastern Pennsylvania furnace for No. 2 plain (1.75 to 2.25 silicon) and $1 higher for No. 2 (2.25 to 2.75 silicon). Central Pennsylvania foundry iron is obtainable at equivalent prices. Some No. 2 plain has been sold at $27 eastern Pennsylvania furnace which is the lowest price done so far. Speculative interests have tried to buy 1000 tons of eastern Pennsylvania foundry iron at $25 furnace for No. 2 plain, offering spot cash but no maker would do this price. Further sales have been made as high as $29 and $30 base eastern Pennsylvania furnace. The last sale of gray forge was at $28.50 eastern Pennsylvania furnace. Malleable now can be had at $29.50 eastern Pennsylvania furnace. While the basic market is untested, this grade could be had at $27.50 eastern Pennsylvania furnace. A lot of 100 tons of copper-bearing low phosphorous iron was sold at $40 furnace.

Lower Prices Being Met

Pittsburgh, Feb. 22.—Basic and bessemer pig iron now have found their market levels at $25 and $27 valley respectively. Two merchant interests now are quoting these figures. The company which led off with those prices last week reported having booked at least three lots of 1000 tons each of basic, and some involving smaller tonnages as well as a few lots of bessemer in smaller amounts than 1000 tons from its regular customers. It has several more negotiations now under way. W. P. Snyder & Co. are meeting these levels to protect their customers but report that only a few inquiries are current. One inquiry recently issued calls for 5000 tons of basic for export to Scotland and on this a price considerably higher than $25 has been quoted. Off-grade basic is obtainable from steelworks furnaces at $24 and possibly lower prices can be done depending upon how urgently the stocks must be disposed of. Several thousand tons of basic of this character were disposed of during the week at $25, Mahoning Valley furnace. Another export inquiry involves 500 tons of malleable and a recent sale of that grade in Montreal, Canada, was made on the basis of $30 valley. The malleable grade is said to be obtainable on the same basis as bessemer iron, namely $27 valley. Interest in foundry iron continues and some of the largest inquiries recently put out involve 500 tons of No. 2 foundry (1.75 to 2.25 silicon) for the American Radiator Co., Titusville, Pa. This order is understood to have been placed although the details are not available. Other inquiries involve from one carload to 400 to 500 tons and the prevailing price appears to be $27 valley with several interests still quoting $28. The Union Radiator Co., Johnstown, Pa., has closed on 250 tons of foundry iron at $28 delivered Johnstown from an eastern Pennsylvania furnace through a broker. This would be equivalent to $25.20 valley since the freight rate from Johnstown to the valley is $2.80. Gray forge is quotable on the basis of $1 under No. 2 foundry or $26 valley and one contract for immediate delivery closed recently on that basis involves 150 tons.

Buffalo Market Dull

Buffalo, Feb. 22.—Business in the pig iron market is somewhat improved this week, though general conditions come close to establishing a record for inactivity. One interest lists its week's sales at 4650 tons, all foundry iron. This is the biggest total reported by one furnace in weeks. Salesmen for this furnace report that melting is increasing throughout the districts where sales were made. One sale comprised 2500 tons. Inquiry for a large aggregate tonnage is reported by this furnace, including one for 2500 tons, two for 500 tons, one for 600 tons, and one for 1000 tons of malleable on which $30

was quoted. The new inquiry since last week totals nearly 4000 tons. The going price was $30 base for all foundry iron sold. One furnace here has sold some resale iron for delivery outside the district at a $28 base, it is reported. But three merchant stacks in this district are making iron. Another furnace here sold 1500 tons at $30 for No. 2 plain (1.75 to 2.25 silicon).

Basic Sales Made at $25

Youngstown, O., Feb. 21.—Decrease in the demand for finished products recently created an excess supply of steelworks pig iron at certain plants in this district and several orders have been closed against this tonnage during the past week. Various sales of slightly off-basic iron were included in last week's business taken by steelmakers in this district at $25 valley. The aggregate of these was about 5000 tons.

St. Louis Prices Uncertain

St. Louis, Feb. 22.—Sellers of pig iron are unanimous in the statement that business in this district since Feb. 1, is the dullest they ever experienced. Several have not negotiated a single sale, while others say tonnages they have sold are too insignificant to mention. Inquiries are almost as scarce as sales. Prices continue in a state of great uncertainly, hardly any two quotations obtainable being identical. The lowest offering by furnace is $27.50 for No. 2 Southern foundry (1.75 to 2.25 silicon) but there is little doubt that $25 could be done on a sizable order. One Southern interest still is quoting $38, and a variety of figures are mentioned between that price and $27.50. There having been no sales it is impossible to determine what the market price actually is. The lowest price heard of thus far was a sale of 150 tons of 4 to 5 per cent silicon to a Quincy melter at $31, delivered. Freight and differentials considered, this would be equivalent at about $21, Birmingham base. The tonnage involved was on resale. It is noted that resale iron has nearly disappeared, one reason being that the foundry price is so near that of resale holders prefer to keep the iron rather than make further sacrifice. Some foundries have good accumulations. Nearly all interests have considerable material under contract.

Business Slow in South

Birmingham, Ala., Feb. 22.—The pig iron market still is slow in the South despite the reduced prices. Tne announcement by one of the smaller companies of a $27.50 quotation for No. 2 foundry has failed to induce any sizable sale and indications point to consumers holding off in anticipation of further reduction. Sales in this territory have been in small lots and for immediate delivery. Reports still are to be heard that some of the larger consumers have purchased round tonnages for future use but inquiries have failed to verify these. As stated, the sales admitted by producers aggregate a very few thousand tons.. Few inquiries being received. The local melt is showing but little improvement.

Some sales of Southern iron have been made at $26.50 base within the last week including 500 & 1000 tons for prompt delivery taken by radiator interests.

Coke Output Is Declining

Spot Furnace Fuel Available at $4.50 but Demand Continues Light—Foundry Coke Market Fairly Active

Pittsburgh, Feb. 22.—Beehive coke production is declining steadily and due to decreased operations on the part of the Steel corporation's plants, the H. C. Frick Coke Co., likewise is curtailing. Five operations were closed down last week and others probably will follow, since the Carnegie Steel Co. will bank more blast furnaces shortly. The Frick company's operations probably will not exceed 70 per cent, while the independent coke ovens are upon a scale greatly below that. Indicative of the limited operating schedules among merchant ovens, only 19,080 tons of coke were produced in the week ended Feb. 12 this year, while a year ago that week saw approximately 97,000 tons produced. There practically is no spot market for furnace coke and while $5 remains many operators asking price, $4.50 coke is available, and at times even $4 can be done. The latter applies where quick disposition is necessary. No contracting for furnace coke is going on and those contracts booked on the sliding scale basis of 5 to 1, with a $5.75 minimum, probably will be adjusted as to minimum or as to ratios, bringing the price more in line with the spot market levels, as soon as the demand opens up. A fair demand continues for foundry coke, the spot market on which is $6 to $6.50, although prices lower than that have been quoted, $5.50 and $5.75 having been noted recently. One large coal and coke operator, which has closed down its coke department disposed of a large number of cars to its regular customers who desired that particular brand. Spot needs for foundry coke are being filled by those still in the field and most orders do not exceed a carload. No new contracts are being written for foundry coke and those of long standing, booked six to 12 months ago are being adjusted in harmony with the market. According to *The Connellsville Courier* production for the week ended Feb. 12 was 146,140 tons as again t 157,180 tons the preceding week.

New England Prices Uncertain

Boston, Feb. 21.—Because of the large range in prices of coke offered in New England, the by-product companies have discontinued their practice of maintaining a fixed level and are meeting competitive business, at least in the case of consumers favorably located. The demand is so light that the present policy as regards prices is not important.

Demand Prompt Coke Only

New York, Feb. 22.—Prices now quoted on foundry coke for quick shipment range from $5.50 to $7.50, Connellsville. It is impossible to obtain coke of recognized quality at less than $6. and prices of the good brands in most cases range up to $6.50. Only one interest is asking more, quoting $7.50. Sales of coke in this district continue limited to small or moderate sized tonnages for prompt delivery. The northern New Jersey by-product coke maker continues to ask $6.50, Connellsville, on by-product foundry coke shipped during February.

Prices Continue Downward

Cincinnati, Feb. 22.—Coke prices continue to sag, while production becomes more limited. Concessions are being made on most sales. In a few instances foundry coke has sold under $8, ovens. There appears to be no stable or reliable schedule of prices.

Heavy Deliveries Continue

St. Louis, Feb. 21.—The tone of the coke market is decidedly weak, and aside from a few small orders for immediate shipment, business is almost at a standstill. Deliveries from points of production in the East continue heavy, and in some yards the accumulations are the largest in recent years. No contracting for forward delivery is reported. By-product interests report surplus stocks both of metallurgical and domestic coke. Foundry coke is quoted at $6.50 to $7, and furnace at $4.75 to $5. Southern ovens are offering coke in this district, but they have found few takers.

More Releases

In Tin Plate Being Received—One Mill Makes Concession

Pittsburgh, Feb. 22.—Signs of improvement in the tin plate market are becoming more pronounced. Releases against old contracts are more numerous and sizable, and shipping orders on material for March and April delivery are being received. One large can-maker ordered 16,000 boxes shipped forward on Monday of this week and officials of another large can company with headquarters in the East will confer with the American Sheet & Tin Plate Co. this week on a schedule for March. The American company is maintaining 70 per cent operations and these could be increased but for the fact that only one-third of normal specifications for stock schedules have been issued by it thus far. Sizable new business in this product still remains scarce, however. While some makers believe that users are holding off for price concessions, only one case where under $7 per base box was named, has been heard. This excepts the low levels of from $5 upward applying on the tin plate originally intended for export, which is said not to exceed 3000 tons, scattered along the Atlantic seaboard. The concession referred to, namely to $6.75, is not considered important. More plants are starting up on accumulations. This includes one important independent company in the Pittsburgh district as well as the Weirton Steel Co., Weirton, W. Va., which resumed full operations on 26 mills last week, and the McKeesport Tin Plate Co., McKeesport, Pa., which yesterday increased operations to take in all of its 44 mills. It had been running 24 mills.

Bar Buyers Holding Off

Large Share of Mill Capacity Remains Idle—2.00c Sales At New York —Pittsburgh Makers Quote 3.25c on Cold-Finished

Chicago, Feb. 22.—Users of steel bars apparently have sufficient stock or do not need much material and are keeping out of the market. The Illinois Steel Co., continues to quote 2.73c, Chicago or 2.35c Pittsburgh, while independent producers are willing to take business at 2.48c, Chicago, where necessary to meet competition. The Inland Steel Co., continues operation on a small schedule and is not able to accumulate sufficient business to increase its rate.

Bar iron mills for the most part are idle and only a few scattered inquiries for this material are being received. The quotation is nominally 2.68c, Chicago mill, with some makers willing to shade, and undoubtedly offers of attractive tonnages would bring lower figures immediately.

Mills producing hard steel bars from old rails are down and in the absence of demand there seems little likelihood of their resuming. A nominal quotation of 2.50c, Chicago mill, prevails.

New England Market Easier

Boston, Feb. 21.—Greater softness in bars is apparent, steel mills showing a willingness to meet prices below their open quotations. Several fair tonnages of bars were placed at 2.25 but other sales showed concessions below this.

Fair Sized Orders Placed

New York, Feb. 19.—Of all the finished steel products none is creating more market interest at present than steel bars. Numerous reports are heard as to the extent of present price cutting. It is learned, however, that the lowest price done in this district was 2.00c, base, Pittsburgh, and 2.38c New York at which 1000 tons of bars were placed. This figure is considered extremely low and in very few other cases have the mills quoted anything near it. An order for 1100 tons of bars for export was placed at 2.10c, base, Pittsburgh, and this figure represents the usual minimum. These prices are being reserved only for the most attractive tonnages, and the ordinary run of business is not bringing out anything less than 2.20c. Sales involving moderate sized lots are bringing 2.20c to 2.30c, Pittsburgh. Some small business in forging bars has been done at 2.50c, base, Pittsburgh. Prices which are being quoted on reinforcing bars range all the way from 2.10c to 2.25c, base, Pittsburgh. Iron bars so far have not been offered at less than 2.35c, base, Pittsburgh.

Operations at 25 Per Cent

New York, Feb. 22.—While a sizable inquiry might bring out some shading in iron bars, business of this character is lacking, and prices continue to be quoted at 2.35c, Pittsburgh.

Minimum Price 2.10c

Philadelphia, Feb. 22.—The minimum price on steel bars that has come out in this district is 2.10c, Pittsburgh, and this figure is quoted only on attractive tonnages. Current business here generally is limited to small lots which is going at 2.15c to 2.35c, Pittsburgh.

Sizable Tonnages Lacking

Pittsburgh, Feb. 22.—Outside of one sale of 800 tons of bars made this week to a Pittsburgh user on the basis of 2.10c, base, Pittsburgh, no sizable business is developing as a result of recent price concessions. Only a few inquiries are current and spasmodic purchases are made to cover spot needs. So far as reported it has not been necessary to go to 2.00c here as yet although it is not definitely stated that this figure would not be named on a large and attractive order.

Refined iron bar makers report a sustained lack of demand and they are placing great hopes in the railroad business which they anticipate will develop soon. Prices vary from 3.25c to 6.50c, although operations continue on an exceedingly low basis. It is stated that no reductions will be made until the new puddling rate is announced for March and April. One reason given for the lack of demand at present is the large stocks in the hands of users.

Shafting Price Shaded

Pittsburgh, Feb. 22.—Requests for cold-finished steel bars continue to be withheld. A definite lower quotation is difficult to obtain in the absence of any sizable business, but while most rollers continue to name 3.60c, it is understood that in a few cases concessions of as much as $7 per ton have been made, some tonnage recently having gone to Cincinnati at 3.25c, base, Pittsburgh. It is understood that where competition is offered that is the price that will be named. Automobile demand still is lacking although from time to time some small demand for industrial shafting develops.

Carloads Go at 2.10c

Cleveland, Feb. 22.—As little as carload lots of bars have been closed in this territory with certain mills the past week at 2.10c Pittsburgh and it seems a settled fact that a considerable concession from this figure would be done on attractive tonnage. Automobile parts manufacturers in this territory have been ordering out a little more tonnage from the mills, but this does not signify any appreciable improvement in demand from the automotive industry. Rivet prices continue soft.

Bolts Are Shaded

Chicago, Feb. 22.—Demand for bolts and nuts has become progressively duller, and this department, after holding up much better than others for a long time, has finally dropped to a point of dullness. Some business is appearing from time to time but it is not sufficient to keep plants active and in the effort to obtain orders some makers are shading by offering 5 to 10 points additional discount. This has not served to increase business and not all makers are following this plan.

Shading Not General

Philadelphia, Feb. 22.—Some shading has developed in prices of nuts and bolts. In some cases makers outside this district have been quoting 60 and 5 off on large bolts, instead of 60 off, which is the usual schedule. This shading is not general, however, and fair sized orders have been taken in the past week on a basis of 60 off.

Demand Less Urgent

Pittsburgh, Feb. 22.—Makers of nuts, bolts and rivets report that the demand for their product is more curtailed than ever. New inquiries are developing slowly and orders involve negligible tonnages. Plant operations vary from 30 to 70 per cent, the latter high rate being maintained at the plant of the Oliver Iron & Steel Co., which was able to retain considerable business on its books when the industrial slump came. Some plants are stocking one-half their output, although many are shipping out their entire production which is not large. Average operations among rivet manufacturers as develop at their meeting in New York city recently, is said to be 30 per cent.

Buying of Alloys

Limited to Carloads for Spot Needs—Prices Could Be Shaded

New York, Feb. 19.—To obtain ferromanganese at first hand it now is not necessary to pay higher than $95, delivered. It is likely it could be shaded. Current demand is small and limited to inquiries for a few carloads for prompt.

Spiegeleisen has been sold in carloads at prices which establish the first hand market at $34 to $37, furnace, for 20 per cent metal. Demand continues small.

The resale offerings of 50 per cent ferrosilicon recently reported at $80, delivered, and in some cases down as low as $76, have disappeared and it now apparently would be difficult to shade the prices quoted by producers, $93 to $95, delivered. Some large business still remains pending, including the Steel corporation's 1921 requirements.

The ferrochrome market remains quiet, with several large alloy steel makers still to take action on their 1921 needs. Ferrochrome, 60 to 78 per cent chromium and 6 to 8 per cent carbon, is unchanged at 16 to 16.50 cents a pound contained. Ferrovanadium is unchanged at $5 to $6.75 a pound contained. Ferrotungsten has been inactive, prices on foreign material averaging about 55 cents, f.o.b. New York, while domestic makers generally are not attempting to compete. Tungsten concentrates are quoted $2.75 to $3 a short ton unit.

Market Continues Dull

Pittsburgh, Feb. 22.—The ferromanganese market continues dull. Some resale material still is available at prices as low as $90, delivered.

The United Alloy Steel Corp., Canton, O., is understood to have placed

a contract for its year's supply of ferrochrome and the price is said to have been 16.50 cents. Under normal conditions this consumer is said to use 100 to 150 tons monthly.

Carload inquiries appear spasmodically for 50 per cent ferrosilicon and prices quoted vary from $92 to $95, delivered, but prices as low as $82 to $85 are heard. Some resale material recently was offered at $76 and $80. A local buyer purchased a carload of 50 per cent ferrosilicon at $95, delivered, in bags or barrels. Another Pittsburgh district user bought a carload of 11 to 12 per cent material at a price understood to be $56.30.

No demand exists for spiegeleisen. The $40 purchase price is nominal and tonnage could be placed at $35, furnace.

Domestic Offers $90 to $100

Philadelphia, Feb. 22.—Domestic ferromanganese now can be had at first hand at $90 to $100, delivered. Few sales of either ferromanganese or spiegeleisen are being made.

Propose an Occupational Tax on Iron Mining

Duluth, Minn., Feb. 22 (By Wire)—A bill for an occupational tax on mining, based on the tonnage of iron ore mined is to be introduced in the Minnesota state legislature. It will be substituted for the tonnage tax and other tax bills previously introduced, and will be in addition to other taxes on mining operations in the state. Such a tax would be legal, in the opinion of Clifford L. Hilton, state attorney general. The revenue derived from the tax would be placed in a special fund to be used for general and educational purposes. Mining men will continue the fight against the bill as a special tax on industry.

Shafting Price Shaded

Pittsburgh, Feb. 22.—It is not denied by makers of hoops and bands that prices lower than 3.05c base Pittsburgh are available. The impression prevails, however, that no business is to be had by cutting the price at this time, although on attractive tonnages, makers probably would go as low as 2.80c, representing a concession of $5 per ton. One or two small contracts for second quarter delivery are reported to have been closed recently at the industrial board level of 3.05c base.

Issues Mortgage Bonds

Through the First National bank, Pittsburgh, and J. H. Holmes & Co., that city and New York, the Follansbee Bros. Co., Pittsburgh, is issuing $4,000,000 in first mortgage 20-year 7 per cent sinking fund gold bonds, dated March 1, 1921. The proceeds of these bonds, together with an additional $1,000 000 realized from the proposed sale of that amount par value of common stock will be used to retire an issue of $1,500,000 of 7 per cent cumulative preferred stock; to complete the company's sheet and tin plate plant at Toronto, Ont., and provide additional working capital.

Prices of Plates Are Soft

2.10c Pittsburgh Quoted in New York, and a 2.15c Done Elsewhere —Tonnages for New Car and Tanks Up for Bids

New York, Feb. 22.—The lowest price which has appeared on plates here is 2.10c, Pittsburgh, at which a mill offered to book specifications. Current business which is limited to small tonnages generally is bringing 2.15c to 2.45c, Pittsburgh.

A feature of the market is two inquiries aggregating 7000 tons of steel for tank work. One has been issued by a local engineer for 4500 tons for 20 oil storage tanks to be erected in Texas and Oklahoma, and the other has been put out by the United States shipping board for 2500 tons for 12 oil storage tanks.

Most Sales at 2.54c

Philadelphia, Feb. 22.—Current plate prices range from 2.15c to 2.45c Pittsburgh, but very little business is being done here at the lower figure. Plate buying involves only small lots, which are going at close to 2.45c, Pittsburgh. Eastern mills are not as a rule quoting the minimum prices, saying either their costs do not permit, or demand does not justify shading.

Aggregate Tonnage Not Large

Pittsburgh, Feb. 22.—Those independent companies which are offering lower prices on plates have been able to book small lots at varying prices. The aggregate bookings are not comparably large. The lowest price heard so far has been 2.15c, although the Cambria Steel Co., has booked a few odd lots involving several hundred tons at 2.25c, while 2.35c also has been obtained. The prices being named by this company are dependent upon the specifications, tonnage, etc. Carload orders are not infrequent at 2.40c and the Carnegie Steel Co., as well as some of the independent companies continue to name 2.65c. The Steel corporation continues to receive specifications but new orders are said to be scarce. One inquiry recently was received by an independent company from a tank builder involving 500 tons but action has been postponed until March. One order for 600 tons, booked early this week, specified mostly plates, the remainder being shapes, for barges. This business is understood to have gone at 2.25c, base, Pittsburgh.

Small Tonnage Is Placed

Cleveland, Feb. 22.—A mixed lot of 400 tons, mostly plates, for tank work for the Standard Oil Co. at Toledo has been awarded to an eastern independent mill. It is understood this business went on a basis of 2.25c base Pittsburgh for plates, 2.20c for shapes and 2.10c for bars. Reports of sale of tank plates in southwestern districts at 2.15c Pittsburgh have reached this district. Little new plate business is current.

Demand at Low Ebb

Chicago, Feb. 22.—Not only is there small demand for steel plates from boiler and tank makers, who were fairly busy up to a short time ago, but some tonnage to go into freight cars has been diverted to eastern mills by the apparent decision of the American Car & Foundry Co. to build its share of Louisville & Nashville cars in the East. This removes probably 9000 tons of plates from Chicago plants. However, the current inquiry of the Santa Fe railroad for 1000 gondolas will make up in part for this loss, as a share of the 10,000 tons of steel for this construction will be plates. The Illinois Steel Co. continues its quotation of 3.03c, Chicago, for steel plates, while local independent mills are meeting quotations of an outside independent as low as 2.63c, Chicago. In the lack of demand there is small competition, and the price cutting has not attracted much attention.

Warehouse Prices Lower in Some Centers

New York, Feb. 22.—While some of the smaller warehouses are offering concessions, the local market generally is adhering rigidly to the level quoted by the Carnegie company at Waverly, N. J. Some speculation is rife as to what effect the recent reductions by the independent mills will have, but it is generally believed that no general reduction will be made unless the leading seller lowers its prices.

Prices Are Readjusted

Philadelphia, Feb. 22.—Warehouse prices here have been further readjusted during the week. On some lines of shapes out of stock, 3.50c is now quoted, while black sheets call for 5.75c and galvanized sheets, 7.00c.

Demand Is Better

Buffalo, Feb. 22.—Inquiry is better and comes from a wider radius of buyers. Many users of material decline to buy, even though they have business on their books which warrant it, and this is helping to slow up business somewhat.

Prices Continue To Hold

Cleveland, Feb. 22.—Demand for warehouse products is at an extremely low ebb. An occasional carload is sold but in the aggregate business is dead. A leading jobber in sheets is expected to shortly put into effect lower quotations. Other independent jobbers in the district indicate they do not intend to lower their quotations until there is a movement on the part of Steel corporation warehouses.

$3.00 Drop In Detroit

Detroit, Feb. 22.—A drop of approximately $3.00 per ton on practically all steel products out of warehouse has been effected by a leading jobber here, who recently issued a revised schedule. The new schedule quotes steel bars, 3.43c; iron bars, 3.43c; shapes, 3.53c; plates, 3.73c; No. 10 gage blue annealed sheets, 3.63c; No. 28 black sheets, 5.60c; No. 28 gage galvanized sheets, 6.95c; bands, 4.13c, and hoops, 4.13c.

Scrap Remains Lifeless

Prices Continue To Show Weakness, though Dealers Believe Bottom Has Been Reached—Railroad Offerings Less Plentiful

FOR COMPLETE SCRAP PRICES SEE PAGE 586

Chicago, Feb. 22.—If conditions in the market for iron and steel scrap can be duller than they have been over the past few weeks, that is the present condition. Except for tonnages bought to apply on unfilled contracts for the Gary plant, dealers have practically no outlet for their material and shipments to that destination have been almost enough to cover its requirements. As a result dealers are again accumulating scrap in their yards. They feel it necessary to take over railroad tonnages offered from time to time, and in the absence of buying on the part of consumers they are forced to hold the scrap. As a result of the present condition, quotations on many grades have been lowered 50 cents to $1 per ton during the past few days. Heavy melting steel remains at $15 to $15.50, with numerous other grades closely allied to heavy steel at about the same level. Railroad offerings are not as plentiful as has been the case, but probably this is only an incident. The Pennsylvania lines offer 400 tons, and the Rock Island 3200 tons. In the latter list are 600 tons of No. 1 steel rails and 500 tons of angle bars.

Some Tonnage Moves

Boston, Feb. 22.—An increasing number of sales of scrap were made during the week in New England due to the necessity for small dealers to raise cash. The feature of the market is the presence of orders from Pennsylvania steel mills. These are all at low figures, in many cases actually below the local market after freight has been deducted. The larger dealers without exception are buying all tonnage that appears at concessions. The foundry demand in New England continues slack. No. 1 machinery sold during the week at $23, delivered. Demand for borings for rolling mill use has dropped off and one dealer reports inability to sell even at $7, shipping point. Chemical borings have been sold at $9. Interest in pipe has increased, although there is little stock available. While prices in some grades have softened, the level is practically the same as it was a week ago. The price of railroad wrought, based on several recent sales, has advanced from $15 to $15.50.

Storm Affects Eastern Trading

New York, Feb. 22.—Recent heavy snowfalls have brought operations at the scrap yards in this district practically to a standstill. Shipments have been reduced. Prices are unchanged, although some weakness is reflected in cast scrap, of which there seems to be an unusually large supply at this time.

Refuse to Accept Prices

Philadelphia, Feb. 22.—Dealers are showing more of a disposition to refuse bids on large tonnages of scrap offered at the current prices. For instance, a couple of mills which inquired as to the outlook for buying large lots of heavy melting steel at $14 and $14.50, delivered, were told large lots could not be had at these prices. No assurance was obtained, however, whether the mills would buy even if they could at these prices. In the meantime small lots of heavy steel continue to sell at $14.50, delivered. Some low phosphorus was sold at $21.50, delivered. Prices are lower on some other grades.

Market Still Remains Weak

Pittsburgh, Feb. 22.—Scrap sales involve only limited tonnages. It is understood that the National Tube Co. recently purchased 250 tons of No. 1 cupola scrap at $22.75. Its original inquiry is said to have been for 500 tons. It now is out of the market and efforts to sell it two carloads at a "distress" price were without avail. No. 1 cupola cast is quotable at $22 to $23. Some demand is current for heavy breakable cast but there seems to be a considerable shortage. The West Penn Steel Co. recently indicated its willingness to pay $15 or $16, but dealers are having difficulty in picking up tonnages to sell at that figure. Recent small sales of cast iron borings and shovel turnings have been made around $12.50. Prices have been reduced as follows: Cast iron borings, from $12 and $13, to $11.50 and $12.50; shovel turnings, from $12 and $13 to $12 and $12.50. Heavy axle turnings are considered quotable at $12 to $13 although these as well as all other scrap prices are conceded to be nominal at this time. Those steel companies which use their own scrap are turning out more than they utilize in their melts. An extremely limited tonnage of scrap is appearing from automobile plants and most of these as well as other scrap producers are retaining their stocks for a possible advance in the market.

Buffalo Market Dull

Buffalo, Feb. 22.—The scrap market is exceptionally dull. Mills figure that the bottom has not been reached, but indications are that it has, and many dealers are speculating on this. It is believed that few dealers would care to sell large tonnages at $15. Mill operations are increasing. Stockpiles are diminishing, and indications are that it will be necessary to make some purchases soon.

Prices Are Uncertain

Cleveland, Feb. 22.—Absolutely no trading is apparent in iron and steel scrap. Little if any shipping is being done on contract and the market is purely nominal, lack of transactions making prices difficult to determine. No change in quotations has been made during the past month although it is the general impression that the bottom has not been reached.

Stagnation Prevails

St. Louis, Feb. 21.—The market for scrap continues quiet. The mills have not resumed buying and foundries and other consumers are not taking scrap. The only activity consists in moving small tonnages already disposed of and endeavoring to cover material recently sold short. The railroads have no lists now pending. It has been impossible to gage the market, and in dealers' lists changes were confined to heavy melting steel, old car wheels and frogs, switches and bars, which were lowered 50 cents to $1. Car wheels are plentiful and not much wanted. Some relayers are being offered by dealers as low as $36, but there have been no takers. Stove plate is scarce, as is all country scrap.

Good Stocks Available

Birmingham, Ala., Feb. 21.—The scrap iron and steel business in the South continues dull. Dealers are as uncertain as ever when a change for the better is likely to set in. Good stocks of old material are on hand and this apparently is one of the reasons why consumers are not anxious to buy. Prices remain unchanged, but the tone of the market is weaker. Heavy melting steel is down to $15 and lower

Strip Prices Unsettled

Pittsburgh, Feb. 22.—The policy of the makers of hot and cold-rolled strip steel here is to name the regular prices of 3.30c and 6.25c, base Pittsburgh, respectively, but to give the impression to the few inquirers for material that the matter of price lies open for discussion. So little business is going, however, that makers are not inclined to announce any general concessions. The impression prevails that if tonnage business, where the possibility for the placing of the orders immediately would be presented, the regular prices would be shaded as much as $5 per ton. While there are reports of quotations having been made on that basis, or at 3.05c on hot and 6.00c on cold-rolled, these have not been definitely confirmed. One encouraging development in connection with this market is the growing tendency of automotive companies to release suspended contracts. The Ford Motor Co. has authorized releases to its parts companies and releases on strip steel are anticipated about March 1. A limited amount of business is developing from stamping and drawing companies.

Plates Are Awarded

Washington, Feb. 22.—The 400 tons of steel plates wanted by the navy department for the Washington navy yard have been awarded to the Carnegie Steel Co., for 2.65c, Pittsburgh. This price was put in by all bidders, but Carnegie offered delivery within 30 days, while the other bidders asked 30 days time.

Offer Surplus Bar Steel

Washington, Feb. 22.—A lot of 1500 tons of bar steel, now at the Frankford arsenal, Philadelphia, is being offered for sale by the war department, bids to be opened at noon on Feb. 25.

Bids for all or part of the 1500 tons will be accepted. Bids for this material should be sent to Capt. Walter C. Hamilton, ordnance bureau field service representative, at the Frankford arsenal.

Full Operation

Still Carried on By Tube Mills—Iron Pipe Reductions Expected

Pittsburgh, Feb. 22.—Current demand for lapweld and buttweld iron and steel pipe remains fairly well balanced. Mills for the most part are able to maintain approximately 100 per cent operations although one of the larger independents in this territory has one pipe furnace down for repairs. Inquries continue to develop for all grades but considerable reluctance to place orders is noted. This refers particularly to iron pipe since users anticipate lower prices because makers frankly tell them that as soon as costs permit, a lower level more in harmony with steel pipe will prevail. This depends somewhat upon the puddling rate to be fixed to apply for two months from March 1, and around that date a reduction in the price of iron pipe can reasonably be expected. New inquiries call for both standard merchant pipe and oil country goods with a shade of preference for the former. Well established line companies continue to specify their requirements but this character of business is not so extensive as was the case several weeks ago.

Better Tonnage Moving

Chicago, Feb. 22.—With the season for pipe laying approaching, cities are buying more than they did during the winter, but purchases generally are smaller than would be the case at a lower price level. The United States Cast Iron Pipe & Foundry Co. has been awarded 100 tons at Cincinnati and 250 tons at Rockford, Ill. The Lynchburg Foundry Co. has been awarded 500 tons at Grand Rapids, Mich. The National Cast Iron Pipe Co. is low bidder on 750 tons at Council Bluffs, Iowa. New inquiry includes 100 tons on which figures were opened Feb. 23 at Fort Dodge Iowa, and two additional lots asked by Detroit, 1000 tons and 680 tons, on which figures will be taken March 2 and 3. While quotations are practically at the established level, slight shading is being done, 5 to 10 cents per ton often being sufficient to obtain the business against competition. While no change has been made in quotations, it is believed the generally lower figures prevailing on pig iron will be reflected shortly in pipe.

Still Anticipating Activity

Birmingham, Ala., Feb. 22.—Cast iron pipe makers in the Birmingham district are still looking forward to a better volume of business. Some specifications are reported and a few orders are said to have been placed. However, the aggregate of new business is not large. Some customers are looking for further concessions on price, now that the pig iron market again is lower. Production of pipe is low.

Sheet Output Very Low

Valley Makers Run Only 5 Per Cent—Quote Down $5 to $7 and Acquire Some Tonnage—Market Generally Quiet

Youngstown, O., Feb. 22.—Lack of interest characterizes the sheet market in this district, mill operations at the start this week were confined to 5 per cent of capacity, the lowest in several years under ordinary conditions. Industrial board prices are 4.35c for black, 5.70c for galvanized and 3.55c for blue annealed, now appear to be out of line and generally are so considered by certain independent sheetmakers here who have been sharing in the small volume of business. As near as the market can be gaged in this district, verified by recent sales, galvanized is off $7 a ton and black $5 a ton, the nominal asking price of the various grades being 4.10c for black, 5.35c for galvanized and 3.30c for blue annealed, Youngstown. As low as 3.85c to 3.90c Pittsburgh is reported on black sheets. Shipments from one source last week included 15 carloads of galvanized for a Texas consumer which was billed at 5.45c, Youngstown. Inquiries are extremely light. Mills which have been idle for the past few weeks have been seeking business actively and have been successful in getting some tonnage on their books. The recent reductions on the part of independent makers, have caused shipping instructions to be held up unless certain mills agreed to revise prices to conform to new conditions. It is understood a large part of the tonnage placed with a mill here recently by a subsidiary of the Standard Oil Co., has been ordered held up. On the other hand, the recent reduction of prices has liberated enough tonnage to warrant the resumption of operations next week at certain mills.

Buyers Hold Back

New York, Feb. 22.—As a result of price cutting, sheet consumers are holding down purchases as much as possible, so that the volume of current business is small and includes only tonnages for quick shipment. Independent makers continue to offer every inducement as far as prices are concerned. The cutting is most evident in galvanized sheets. which can be had at a reduction of as much as $8 a ton, or $5.30, Pittsburgh, for No. 28 gage. Concessions on blue annealed and black sheets in some instances have been as much as $6 a ton on attractive business. Makers believe resumption in demand will mean a quick rebound in prices. There is no indication as yet as to when buying will be resumed, but the mills are a little more optimistic.

Railroad Seeks 200 tons

Philadelphia, Feb. 22.—Included in current sheet demand are several 20 and 30-ton lots, while a railroad is inquiring for 200 tons of blue annealed. Sales have been limited usually to carloads in the past week. These went at various prices, the minimum figures on the more attractive lots being 4.45c, delivered in Philadelphia, for black; 5.65c, Philadelphia, for galvanized, and 3.65c, Philadelphia, for blue annealed. These prices represent concessions of $5 to $8 per ton under the Steel corporation schedule.

An eastern automobile body manufacturer purchased 1500 tons of No. 10 gage hot-rolled sheets on a plate basis of around 2.20c Pittsburgh base. This figures out to a material reduction under the lowest prices that yet have been reported on blue annealed sheets, for which the material will be substituted.

Cuts Do Not Bring Tonnages

Pittsburgh, Feb. 22.—Results of recent concessions on sheets are not particularly encouraging. Only an odd lot of sheets now and then is being purchased, even at the new prices, namely 4.15c on black, 5.35c on galvanized and 3.20c on blue annealed. The American Sheet & Tin Plate Co., continues to name 4.35c, 5.70c and 3.55c, respectively. Its shipments are said to be 70 per cent of normal, and while operations last week were on the basis of 70 per cent, this is due for a reduction possibly before the week is out. It continues to receive some attractive releases although these by no means are comparable to the normal requirements of the consumers. The Ford Motor Co., Detroit, continues to issue shipping orders on sizable tonnages to enable it to keep up to its schedule of 47,000 cars in February and 60,000 in March, to be made up from parts in stock. The stove and implement trades are not consuming their ordinary quotas, the weather being against the former and the lack of buying by farmers serving as a deterrent for the latter. The West Penn Steel Co., Brackenridge, Pa., plans to start its sheet mill within 10 days on the basis of 50 per cent of capacity.

Sheet Production Declines

Chicago, Feb. 22.—Demand for steel sheets is growing less and mills are rapidly approaching the end of their order books. The Inland Steel Co., has been operating full through the past several weeks, but is planning to shut down the week beginning Feb. 28 until it has accumulated sufficient orders. Its production over the past few weeks has been practically at capacity and shipments have loaded up consumers to a point where they do not require further supply at present. With demand at a minimum, it is difficult to determine the present level of prices but undoubtedly an attractive offering would cause some shading.

Iron Stocks Heavier

Stocks of pig iron in the Birmingham district Feb. 1 totaled 159,338 tons which is an increase of 26,039 tons or 19 per cent over that on hand the month previously. The metal piled includes 20,478 tons of basic, 132,000 tons of foundry and 686 tons of machine-cast iron. On Jan. 1 the amount of basic in stock was 15,000 tons, of foundry 113,000 tons and of machine-cast iron, 4000 tons. The total accumulation, therefore, is composed of 13 per cent of basic, 83 per cent of foundry and 4 per cent of machine-cast iron. Of the 14 stacks in blast, seven are producing basic, six foundry and one ferromanganese.

Structural Awards Drop

Bookings Throughout Country Show Loss of 18 Per Cent in Month—Substantial Tonnages of Shapes Believed Available at 2.00c

New York, Feb. 22.—Several inquiries for building work involving from 250 to 500 tons each, have come into the structural market during the past week, and two orders aggregating approximately 1000 tons have been placed, both going to the Hay Foundry & Iron Works. There have been a few smaller individual tonnages awarded, but the market, taken as a whole, has been quiet. A fairly sizable lot of shapes comprising several hundred tons, has been purchased from an eastern mill by one fabricator at a 2.10c, Pittsburgh, basis. A lot of a couple of thousand tons or more would probably bring out a price as low as 2.00c, Pittsburgh, it is asserted. Fabricators prices here range from $100 to $105, erected.

Bookings of the fabricating shops throughout the country in January aggregated 32,000 tons, or 18 per cent of capacity, according to the regular monthly statement of the Bridge Builders and Structural society. This is a decline of 15,000 tons from the preceding month, and is the lowest figure since March, 1919. The decline in the volume of new business is further reflected in the January shipments of the members of the society exclusively, these amounting to 33,000 tons or 48½ per cent of shop capacity, as compared with the December deliveries of 43,000 tons, or 60 per cent. A comparative statement of the bookings of the country's fabricating shops follows:

Month	Per cent	Tonnage
January, 1921	18	32,000
December, 1920	26	47,000
November	27	49,200
October	25½	45,600
September	43	77,400
August	40	72,000
July	50	90,400
June	50	90,400
May	61½	110,000
April	68	122,250
March	83½	150,400
February	95	171,000
January	75	135,000
December, 1919	85	153,000
November	69	124,200
October	77½	139,500
September	78½	141,000
August	18½	141,000
July	74	133,200
June	65	117,000
May	49	88,200
April	26 5	48,100
March	17½	32,300
February	12½	22,500
January	12	21,600

Demand Improves

Philadelphia, Feb. 22.—Shape demand has improved somewhat, but the total still is small. Most of the current business of any size is going at 2.25c, Pittsburgh, although some orders are being placed at 2.45c. In some cases shapes have been sold at 2.15c.

Small Jobs Continue

Pittsburgh, Feb. 22.—Due to the fact that prices as low as 2.15c and 2.20c are available on structural shapes, the tendency to withhold awards is increasing. Many projects have reached the deadlock stage, however, certain mills declining to go below the 2.45c, base, Pittsburgh, price. A few small orders are received from day to day involving small tonnages. The Park-Davis building, Detroit, still is withheld as is the Rayen High school, Youngstown, O., the latter requiring approximately 500 tons. It is understood that the general contracts for the Frank & Seder building, Detroit and the Boston Latin school building, Boston, have been let. Steel in each will total 400 to 500 tons.

Building Holds Off

Chicago, Feb. 22.—While an occasional tonnage of structural material is being closed in western territory, such new business is scarce and most construction seems to be holding back because of price and labor conditions. In the West practically nothing has been closed recently and fabricators have little in their shops. In plain material, the Illinois Steel Co. maintains its quotations of 2.83c, Chicago, while the Inland Steel Co. stands ready to protect its business down to 2.63c, Chicago.

CONTRACTS AWARDED

Plate girder spans for Missouri Pacific Railway Co., 150 tons, to American Bridge Co.

Building for banking rooms, etc., for Liberty Central Trust Co., St. Louis, 134 tons, to Christopher & Simpson Iron Works.

Office building for Joseph Zubow, 13 East Forty-second street, New York City, 450 tons, to the Hay Foundry & Iron Works.

Store addition for Oppenheim-Collins Co., Brooklyn, 500 tons, to Hay Foundry & Iron Works.

CONTRACTS PENDING

One hundred foot turntable for Missouri Pacific railroad, 108 tons, bids in.

Bridge tramway at Havana, Cuba, 185 tons, bids asked by Link-Belt Co., Chicago.

Traveling bridge t Ransom, Pa., 260 tons, bids asked by Link-Belt Co., Chicago.

Pier, Camden, N. J., 300 tons; award to be made shortly.

Fertilizer plant addition, Reading, Pa., 300 tons, bids asked.

Warehouse for the Goodman Co., Jersey City, N. J., 250 tons, pending.

Warehouse for the Payne Co., Wilkes-Barre, Pa., 400 tons, pending.

State highway bridge at Greensboro, N. C., 500 tons, pending.

School building in Troy, N. Y., 300 tons, bids asked.

Want Reinforcing Bars

Pittsburgh, Feb. 22.—While it is apparent that concessions under the 2.35c, base Pittsburgh price on reinforcing concrete bars are obtainable, several companies here continue to quote the bar card rate as named by the Carnegie Steel Co. In contrast to the quiet condition applying to other iron and steel products, considerable interest is noted in reinforcing concrete bars and several tentative inquiries are before makers. The largest of these involves 1200 tons for export. In all probability a concession of $5 per ton could be obtained on an attractive tonnage of this material.

Hospital Tonnage Is Up

Cleveland, Feb. 22.—Bids have been asked by the City of Cleveland on 450 tons of reinforcing bars for the new City hospital. Little business in reinforcing steel is being placed in this territory. Prices of 2.10c Pittsburgh or mill are being quoted both by the rerolled makers and by producers from billets.

Wants Gondolas

Santa Fe Inquiring For 1000 Cars—Rail Inquiry Is Fair

Chicago, Feb. 22.—An inquiry for 1000 composite gondolas has been put out by the Santa Fe railroad and is being figured by carbuilders. While an inquiry has been put out in the East for a considerable tonnage of plates for cars ordered by the Louisville & Nashville railroad from the American Car & Foundry Co., this has not been asked in the Chicago market and probably these cars will be built in eastern shops. Considerable repairing seems to be under way on the part of railroads and quick delivery of rails and track fastenings is being asked generally.

Track Material Active

Boston, Feb. 22.—Inquiry for track material has become unusually active during the past week and material aggregating nearly $1,000,000 is being asked for by the various steam and electric roads. The Boston & Maine is in the market for 2500 tons of tie plates; the Maine Central for 1000 tons, the Bangor & Aristook for 500 tons and for frog and switch material. Nearly all the large electric systems in Massachusetts are inquiring for frog and switch material. The Eastern Massachusetts Street Railway Co., which formerly asked for 1000 tons of rails, has withdrawn that inquiry but is now after approximately $75,000 worth of frog and switch material in addition to a fair tonnage of tie plates and bolts.

Chinese Place Small Order

New York, Feb. 22.—The eastern car market is devoid of new inquiry, and buying appears to be confined to an order by the Wah Chang Trading Corp., 233 Broadway, for 20 flat cars for export to Hong Kong, China, the business going to the Magor Car Co. Locomotive inquiries involve two locomotives for the Koppers Co., Pittsburgh.

Buying Rate Is Fair

Pittsburgh, Feb. 22.—A fair amount of spot buying of light rails continues to develop, one large independent maker here booking 800 tons last week around 2.50c, base, Pittsburgh. This business is coming from diversified lines, coal mine operators, industrial companies while a limited amount is going to traction companies. The coal mining districts, however, continue to curtail their activities, but an increased amount of traction company business can be expected as the spring months aproach.

Lower Operations

Are Shown by Wire Mills—Nail Prices Are Irregular

Pittsburgh, Feb. 22.—Only spasmodic demands for wire and wire products are being received by the mills in this district. Operations are upon a considerably reduced scale as compared with a few weeks ago and now the American

Steel & Wire Co., as well, is feeling the dearth of business. Orders being received here call for a carload of nails or wire or other products, and in some cases mixed carloads are being taken. Most of the mills now are maintaining a base price of 3.00c on wire and 3.25c, base, on nails and the impression prevails in certain quarters that on a tonnage order the nail base would be reduced. In fact, evidence has been furnished to show that nails have been quoted at $3.10, base Pittsburgh, to meet competition offered by Ohio nail mills. One of the larger independents here which is maintaining 3.25c as a base on both wire and nails reports its operations as around 40 per cent.

Fence Demand Better

Chicago, Feb. 22.—Makers of wire and nails believe sentiment is improving, especially in the South, which has been the dullest spot for some time. Although demand in general remains considerably under the volume usual at this season, it is better than during the past few weeks. Many mills are running full and piling the excess of production over shipments.

Resume As Open Shop

The plants of 106 firms in greater New York, members of the allied building metal industries, which have been closed since Jan. 1, when they locked out their employes after refusing to grant them a 44-hour week, were reopened Feb. 13 under the open shop plan. The 48-hour week will prevail and there will be no reduction in wages.

Semifinished Is Inactive

Sizable Inquiries and Sales Still Lacking—Prices Are Soft—2000 Tons of Billets and Slabs Sought for Export

Pittsburgh, Feb. 22.—Inquiries for all forms of semifinished material are scarce; those that are received represent actual requirements only. An inquiry for 2000 tons of billets and slabs for export does not occasion much interest. Prices being quoted are higher than would be the case on domestic business of equal size. Quotations on small lots of forging billets run from $45 to $48, but tonnages are not being sold. What little is coming out originates with locomotive or engine builders and represents filling in lots. This likewise is true of rerolling billets and makers would like to receive tonnages on the basis of $38.50 for the 4 x 4 size, which, with the usual $3.50 differential, makes the price on small billets $42. The former figure, $38.50, now applies to slabs and only a limited amount of business develops from time to time. Sheet bars are being sold spasmodically at $42, although inquiries are exceedingly few. Makers' interest doubtless would be aroused to the acceptance point on tonnage offered at $40.

Requests for skelp tonnages likewise are few. On grooved, universal and sheared skelp better prices now are obtainable, 2.35c, 2.45c and 2.55c, respectively, representing a decline of $2 per ton, and the impression prevails that even $4 might be granted on sizable tonnages. Some companies are with the Carnegie Steel Co., in continuing to name 2.45c, 2.55c and 2.65c, respectively.

Wire rods are quotable at $52 to $57, and sales involving small tonnages only are made from time to time.

Eastern Market Untested

Philadelphia, Feb. 22.—Lowest quotations so far named in this district on semifinished material are $43.50, Pittsburgh, on rerolling and $48.50 on forging billets. The market is untested, but tonnages could be placed under these figures.

Ask $42 for Sheet Bars

Youngstown, O., Feb. 22.—Practically no demand for semifinished material exists in this territory. Several weeks have passed without any inquiries for any form having been received. Sheetmakers are not specifying against their sheet bar contracts, nor is any new business coming out for this commodity. The last sale noted was made at $43, Youngstown. The nominal asking price of sheet bars is $42, mill.

Some Inquiries Put Out

Cleveland, Feb. 22.—Several inquiries of 500 to 1000 tons of sheet bars recently have been before makers in this district. As the latter have shown a reluctance to come down to the low prices in the market, or $42 Youngstown or Pittsburgh, no business has resulted. On large billets and slabs $38.50 Pittsburgh or Youngstown is accepted as the market figure. Operations of semifinished plants in this territory remain at a standstill.

Will Remodel Furnace

Contracts have been awarded Freyn, Brassert & Co., Chicago, by the Rogers Brown Iron Co., Buffalo, for work in connection with the remodeling of the latter company's No. 1 furnace. The general arrangement of the furnace below the mantle, inclusive of bustle pipe and tuyeres, is to be changed and new hearth jacket, tuyere jacket and iron and steel work for bosh are to be placed. There will also be material modification and enlargement of furnace lines and capacity.

Plans Scrap Yard

The Perry, Buxton, Doane Co., Worcester, Mass., and Boston, dealer and broker in iron and steel scrap, recently purchased a tract of land near Coatesville, Pa., which will be used as a storage yard for scrap. The yard will be equipped with trackage, cranes, derricks, shears, etc.

The Parret Tractor Co., Chicago Heights, Ill., and the Hicks Tractor Co., Milwaukee, Wis., have joined in a merger to be known as the Hicks-Parret Tractor Co. with a capitalization of $3,500,000. Vincent Bendix, former president of the Parrett Co., will head the new organization.

The Nonferrous Metals

	‡Copper	Spot Straits New York	†Lead New York basis	Zinc St. Louis basis	Spot† Aluminum	Spot antimony	Nickel ingot
Feb. 16	13.00	31.50	4.55	4.95	25.00	5.25	43.00
Feb. 17	13.00	31.75	4.55	4.95	24.50	5.25	40.00
Feb. 18	13.00	33.00	4.55	4.92½	24.50	5.25	40.00
Feb. 21	12.92½	32.62½	4.40	4.95	24.50	5.25	40.00
Feb. 22	12.92½	32.62½	4.40	4.95	24.50	5.25	40.00

†Open market quotation.
‡Producers, price delivered; outside 12.62½c to 12.87½c refinery.

NEW YORK, Feb. 22.—Metals have shown little change in the past week except for a distinctly lower tendency in lead and nickel. All trade continues extraordinarily small with little improvement in immediate prospect.

Nickel, the most steady of the nonferrous metals as a rule, has joined the procession to lower levels after holding at one set of figures for many months. The leading refiner still quotes 43.00c to 45.00c a pound on ordinary spot and prompt business, and has not announced any other prices, but it is known that on desirable future business or even good orders for nearby, prices of 41.00c to 44.00c can be done. The lower figures apply to shot and ingot, and the higher figures to electrolytic metal. More competition is going in this metal than usual, as a Canadian producer now is active, and old stocks left from the war also are offered, both from domestic sources and for import. As low as 35.00c is heard, but this price is on a lower grade of metal than the regular ingot.

Zinc continues dull. Supplies are plentiful, although production is the smallest in many years. Neither galvanizers nor brass makers are in the market. It is reported from St. Louis that smelters are refusing further to hold back shipments on old contracts. The market hovers nominally around 5.00c. A smelter in this country is reported to have bought 10,000 tons in Germany, for import, because he can deliver the metal, even with duty, more cheaply to his customers than he can produce it here.

Copper is a little weak after a period of strength, and some producers are shading 13.00c delivered for prompt. The outside market, quoted nearly ¼c less for prompt, on refinery basis, is at the same level. Futures are quoted ⅛c to ¼c higher. Brass foundry business is almost dead. Brass mills show a little improvement, but brass prices are unchanged, with rods 16.75c a pound, sheets 18.75c, seamless tubes 22.50c, seamless copper tubes 23.50c. Copper wire is quoted around 16.00c a pound, and is more active than other products. Lake copper is 13.37½c to 13.50c.

Tin is entirely speculative, with wide swings. Spot Straits is 32.50c to 32.75c, and future shipments ½c to ¾c higher.

After the outside lead market had fallen to a lower level, the leading interest made two small cuts in quick succession to a still lower figure, 4.40c New York, and the outside market dropped to the same level, with the St. Louis basis now 4.20c.

Exporters Are More Cheerful

Few Actual Orders Are Coming In, but Confidence Is Expressed in Future Business — Some Important Credits Are Being Arranged — Outlook for Mexican Railway Equipment Orders Is Promising—British Buy German Billets

NEW YORK, Feb. 22.—Judge Gary's announcement that the United States Steel Corp. had extended foreign credits last year up to $20,000,000 caused no surprise in export circles. Similar action has been taken by the Consolidated Steel Corp., and other producers of merchandise intended for export. For the greater part, such credits have not been entirely voluntary but action was taken to protect the sellers in an emergency. Goods sold six months to a year ago were delivered after the world-wide slump in business started. The foreign clients of American houses found themselves unable to make payment. The only alternative left was for the American seller to take the goods back or to extend the foreign purchaser a credit.

The export credits extended in this manner have been for periods varying from 90 days up to a year. Whether the credits will do very much to correct the present slump is a question, depending entirely upon the speed with which world trade may recuperate. The emergency raised by this situation is so acute that even the bankers are being drawn into it. This is a favorable sign inasmuch as it makes it essential that some proper financing method be adopted. Bankers have been unwilling to meet the ideas of foreign borrowers and foreign loans have been lacking in this market. The past week brought to light the first neutral loan since the war. This was an extension of a loan of $24,000,000 to Chile, the securities for which have been offered the American investing public. This is the first South American offering in the market since 1915.

The American Locomotive Co., has made an offer to the Mexican government to assist it in financing its railroad needs. A loan to Sao Paulo also is being negotiated, but this is to be a three-cornered affair, the United States investors being forced to share in it with England and Amsterdam.

Europe as a market for American steel products is absolutely dead at present. It is understood that England has purchased billets from Germany and for the time being has no further interest in the American product. The reduction of ocean rates on steel to European ports does not bring forth any business or prospect of business. Work on the pipe line from Havre to Paris has been postponed indefinitely. This was an American project which was to have cost 100,000,000 francs. The Atlantic & Gulf Refining Co., the backer of the project, said that the work was suspended because of the general financial and business depression.

Reports from the Far East are not particularly encouraging, though there are indications of improvement in both China and Japan. The Japanese apparing to submit an inquiry for 5000 tons of plates and shapes.

Reports from the Far East are not particularly encouraging, though there are indications of improvement in both China and Japan. The Japanese apparently are short of sheets and bars and have been feeling the market here, though so far without substantial results. American manufacturers' agents and supply houses doing business in the Orient look for business of a conservative kind in the near future.

Ask for Bridge Proposals

The Peking-Hankow railway administration has invited proposals from bridge contractors for designing and building a steel bridge about 2800 meters in length across the Yellow river. Tenders must be in by June 30, 1921. From China also comes the news that the Kin Han railway is expected to buy 12 locomotives and 90 freight cars and to call for tenders for railway bridges. Japan has purchased automatic signalling apparatus from the United States for use by the railway department. It is expected that the demand for such signals will follow improvements on the railways of Hokkaido. One American house has received a Japanese inquiry for 120 tons of wire rods.

Trading with Australia still is hampered by the inability of merchants to get the banks to handle commercial paper. Bids for the equipment of the Morwell power station will close March 31. This is one of the important projects in which Americans are planning to participate. There have been numerous sales of hardware and miscellaneous goods to Australia, and one export house is now holding Australian inquiries for $50,000 worth of machine tools, consisting mostly of metal working tools for use in railway shops.

Although the recent large Mexican inquiries for pipe have not as yet been filled confidence is not shaken in that market. Following the announcement of the conference between W. G. McAdoo and President Obregon, it was learned that the Mexican railways will submit inquiries soon for 1600 freight cars. The proposal made by the American Locomotive Co., to Mexico, it is understood, provides for the extension to the Mexican government of credit for one-half of its purchases of the products which that company manufactures. It is believed that Mexico's immediate needs for new locomotives are between $3,000,000 and $4,000,000. The Mexican government requires besides these locomotives more than $10,000,000 worth of other railroad equipment, but so far as can be learned no plan has been worked out for financing those needs.

Large railway business, it is declared, could be developed immediately in South America, likewise, were the credits possible. Car requirements in both Argentina and Brazil have not been filled for a year and without transportation means these countries find it impossible to market their crops. It was reported last week that Brazil ordered 300 freight cars from the United States. It is also known that Brazil has inquiries for couplers, brake beams and other railway materials.

Argentina is in need of all kinds of railway equipment and American houses are anticipating heavy inquiries just as soon as credits can be arranged. A report is current that an Argentine interest inquired for 20 tank cars.

Will Increase Operations

The Indianapolis Drop Forging Co. which had been closed for 90 days previous to Feb. 7, when operation was resumed with a 25 per cent normal force of employes, will put on an additional 15 per cent force next week, according to an announcement by George DeSautels, vice president and manager of the company. Increased orders from automobile manufacturing concerns is given by Mr. DeSautels as the reason for the increase in operation.

States To Attack Railroad Rates

Twenty Railroads and Utility Commissions To Go Before Supreme Court in Effort To Break Transportation Act — Traffic Continues To Fall Off — Carriers' Executives Refuse To Meet Employes

WASHINGTON, Feb. 22.—Another phase of the railroad situation will come to the front next Monday when representatives of 20 state railroad and utility commissions go before the United States Supreme Court and challenge the authority of the interstate commerce commission to prescribe intrastate rates. Involved directly is the order of the commerce commission demanding passenger and Pullman fares within Wisconsin be brought up to the level of interstate rates in the same region. The principle, however, is substantially the same as that involved in the refusal of certain states to advance intrastate freight rates the same percentages as directed by the commerce commission in interstate commerce last July. The ratemaking and return clauses of the Cummins-Esch act will be attacked by the states, and arguments will be presented why the act should be held unconstitutional.

The states contend a decison by the Supreme Court knocking out the Cummins-Esch act, or the Transportation act, would at once preserve the lower freight and passenger rates in effect in a score of states. On the other hand, it is claimed, should the act be upheld, each of the remaining 19 states will have varying grounds for appealing to the Supreme Court from the commerce commission's order. The 19 states joining hands with Wisconsin in the passenger fight are New York, North and South Carolina, Florida, Ohio, Indiana, Illinois, Michigan, Iowa, Kansas, Missouri, Louisiana, South Dakota, Nebraska, Texas, Montana, Utah, Nevada and Arizona.

On these grounds the 20 states will challenge both the construction placed upon the act by the commerce commission and the constitutionality of the act itself.

1. As construed by the commission, it is destructive of our dual form of government and contrary to the spirit of our institutions.

2. It prescribes a fixed return on railroad capital regardless of business conditions.

3. Under the group plan it commands the commission to fix an aggregate value and make rates that will yield in the aggregate the fixed return thereon.

Each week sees high officials of the various railroads more frank in their statements present freight and passenger fares are excessive, but with each such admission is coupled the reservation that rates can not be lowered so long as operating expenses remain at their present level. While arguments are being continued at Chicago, a decision does not seem near at hand. A telling point has been brought out by the carriers in this respect: that between 1917 and 1920 there were no marked increases in road operating forces, but in that period the number of shop employes increased 141,000 or 47 per cent.

Meanwhile, traffic continues to fall off, and freight offerings are declining in spite of the opinion business is on the upgrade. Barring three temporary upturns, the freight loading of the railroads has tapered off steadily since the third week of October, which appears to have been the turning point. If business is improving, it is not being reflected in freight offered the railroads. In the week ended Feb. 5, the carriers loaded 696,997 carloads of revenue freight. In the three preceding weeks they loaded 699,936, 703,115 and 709,888 carloads, respectively. In the week of 1920 corresponding to that ended Feb. 5, freight loading was 762,680 carloads, or 65,683 carloads greater than the week of 1921. In the week ended Feb. 5 the number of idle cars mounted to 358,065, the greatest in the past ten years. Of this number, 122,000 were coal cars. A year ago, the shortage of cars was approximately 150,000.

"The lessening demand for open cars is one of the prime factors in stimulating the return of such equipment to the home roads, and an unusually large percentage of this equipment is returning home in bad order," says the car service division of the American Railway association. "This should be a period of rehabilitation; a definite car repairing program at this time is most necessary if the heavy transportation demands of the near future are to be met satisfactorily."

Executives of railroads in session in Chicago to consider questions relating to the national agreement on working conditions have declared definitely they will not meet national labor union leaders in conference. This conclusion is stated clearly in resolutions adopted by the executives.

The railroad labor board has granted a recess until March 1, which is something of a loss to the brotherhoods since the unions had asked that the board order railroads to meet them in a joint national conference. Hearings will be resumed March 1 in rebuttal of the arguments presented by the railroad executives previously.

A feature of the developments is that a number of minor unions have repudiated the stand taken by B. M. Jewell that the controversy is against organized labor instead of simply an effort to modify rules and working conditions.

Lays Many Rails

About 95,000 tons of new steel rails and 5,300,000 new cross ties were used last year by the Pennsylvania railroad in replacing worn out trackage. Of the 95,000 tons of rails, 82,500 tons, or 87 per cent, was 130-pound rail. The use of heavier than 100-pound rail was commenced by the railroad in 1915 and at the present time only a small percentage of rail used on the system is less than 130 pounds. Steel rails for 1920 use cost approximately $48 a ton, an increase of $8, or 20 per cent over the previous year's cost and 63 per cent more than the cost of rails 10 years ago, according to the company. Ties cost the railroad 32 per cent more in 1920 than in 1919 and 153 per cent more than 10 years ago. Since 1910 the Pennsylvania has laid 1,347,289 tons of new rails and 56,230,904 cross ties.

Index Number Falls

Washington, Feb. 22—The bureau of labor statistics' weighted index number, which covers 327 commodities or series of quotations, fell from 189 in December to 177 in January, which compares with 248 in January, 1920. The index number of the metal and metal-products group was 152 in January, as against 157 in December and 177 in January, 1920. The index number of food fell from 172 in December to 162 in January, of fuel and lighting from 236 in December to 228 in January, and of building materials from 266 in December to 239 in January. In the compilation of these index numbers, 1913 equals 100.

Firm Is Dissolved

The Field & Bruner Co., Kokomo, Ind., dealer in pig iron coal and coke, has been dissolved, effective Feb. 16, Robert Field, retiring. The business is being continued by H. A. Bruner under his own name.

Production Drops

Steel Ingots Fall to Lowest Mark Since Steel Strike

Output of steel ingots for January totaled 2,201,866 gross tons, according to figures compiled by the American Iron and Steel Institute from reports of 30 companies which in 1919 produced 85.12 per cent of the output of the United States. Compared with the December figure of 2,340,365 tons, the January output shows a decrease of 138,499 tons and sets the lowest tonnage since the steel strike in 1919.

Divisions of the production for January are as follows: Open-hearth process, 1,589,961; bessemer process, 608,276 tons; and all other processes, 3629 tons. Corresponding figures for December were: Open-hearth process, 1,687,162 tons; bessemer, 649,617 tons; and all other, 3586 tons respectively.

Following are the institute's production figures for 1920 and January 1921:

Months	Open hearth gross tons	Bessemer, gross tons	All other, gross tons	Total, gross tons
Jan., 1920...	2,242,758	714,657	10,687	2,968,102
Feb.....	2,152,106	700,151	12,867	2,865,124
March..	2,487,245	795,164	16,640	3,299,049
April...	2,056,336	568,952	13,017	2,638,305
May....	2,251,544	615,932	15,688	2,883,164
June....	2,287,273	675,954	17,463	2,980,690
July....	2,135,633	653,888	13,297	2,802,818
Aug....	2,299,645	695,003	5,784	3,000,432
Sept....	2,300,417	693,586	5,548	2,999,551
Oct....	2,335,863	676,634	3,485	3,015,982
Nov....	1,961,861	673,215	3,594	2,638,670
Dec....	1,687,162	649,617	3,586	2,340,365
Total for year..	26,197,843	8,112,753	121,656	34,432,252
Jan., 1921...	1,589,961	608,276	3,629	2,201,866

Average output of the 30 companies per working day in January was 88,074 tons or 103,470 tons for the whole country, since these companies produced 85.12 per cent of the country's output during the previous year. Corresponding figures for December were 90,014 tons and 105,749 tons respectively. January had 25 working days compared with 26 in December and showed an approximate loss of 2300 tons per day. Based on the January tonnage, the annual rate of production for the 30 companies was approximately 27,040,000 tons and for the entire country, 31,770,000 tons. The same figures for the previous month were 27,720,000 tons and 32,570,000 tons respectively.

Allows $2,457,00 in War Minerals Claim

Washington, Feb. 22.—The war minerals relief commission up to Feb. 4 had certified to the treasury claims totaling $2,457,259.25, and had disallowed claims aggregating $6,506,903.14, according to a report to the senate by Secretary Payne. These claims represent expenditures in the war period, chiefly at the request of the government, to develop the mining of manganese, chrome, pyrites and other minerals badly needed in the war. The claims still pending amount to $3,106,697.75, while claims totaling $646,577.47 have been withdrawn. The largest single award made to Feb. 4 by the commission was to the Hanna Minerals Co., Cleveland, covering development work in the South. The company put in a claim for $491,651.48, and received $228,242.11. A claim of $217,879.86 by the Grasselli Chemical Co., Cleveland, has been refused because no government request was made for the work covered. The Georgia Iron & Coal Co. Atlanta, has been awarded $55,406.11, out of a claim for $171,757.12

Capital Stock Increased by Truscon Steel Co.

Youngstown, O., Feb. 22.—The Truscon Steel Co., at its annual meeting in Detroit recently increased the common capital stock authorization from $2,000,000 to $4,000,000, making a total capitalization of $6,500,000. It enlarged the board of directors from seven to nine members, and named Jonathan Warner, president of the Trumbull Steel Co., a director, succeeding R. M. Dyar, resigned. Two additional members of the board are to be elected later. One will be a Youngstown man. President Julius Kahn says orders are being suspended owing to consumers' uncertainty over the trend of steel prices. Announcements by leading steel interests that steel quotations are at the bottom and adherence on their part to the prices named, will speedily revive buying, he says.

To Build Furnaces

The Eaton Electric Furnace Co., Taunton, Mass., recently was incorporated for $95,000, to manufacture tempering furnaces exclusively. The company is already producing a modern electric furnace with an automatic control which insures a constant temperature, current being used only when there is a tendency to cool. The operation of control is through a relay which in turn controls the main switches. In this way the current is turned on at a predetermined minimum temperature and off at a maximum temperature. This economy in current is one of the chief features of the furnace which has recently been placed on the market. Harry B. Eaton is president and treasurer and Edwin I. Hope is secretary.

Sheet Operations

In Mahoning Valley at 5 Per Cent, Lowest in Years

Youngstown, O., Feb. 22.—Sheet mill operations in the Hahoning valley have reached the lowest rate in many years. Only 5 per cent of sheet capacity is engaged, this representing five mills at the Warren, O., plant of the Trumbull Steel Co. All other mills are inactive including eight at the plant of the Mahoning Valley Steel Co., 10 each at the plants of the Republic Iron & Steel Co., and the Newton Steel Co., 28 at the three plants of the Brier Hill Steel Co., 15 at the East Youngstown Sheet & Tube Co., and nine at the plant of the Sharon Steel Hoop Co. The lowest rate heretofore was established the week beginning Feb. 14, when 13 per cent of sheet mill capacity was active. Next week's operating schedule, however, is expected to be more promising inasmuch as the Brier Hill Steel Co., the Newton Steel Co., and the Republic Iron & Steel Co plan starting some mills.

Additional curtailment in open-hearth operations also is recorded. Only 22 units actually are melting. These are distributed as follows: Four at the Trumbull Steel Co., two at the Brier Hill Steel Co., 12 at the Carnegie Steel Co., and four at the Youngstown Sheet & Tube Co.

With the banking of another stack, that of the Republic Iron & Steel Co., about 10 days ago, valley blast furnace operation is confined to 13 furnaces.

In the Canton, O., district the Stark Rolling Mill Co., at the start of this week had 12 sheet mills rolling and the Canton Sheet Steel Co., and the Superior Sheet Steel Co., four each.

Illinois Steel Co., Now Reducing Operations

Chicago, Feb. 22.—After maintaining its operation at about 85 per cent for a number of weeks, the Illinois Steel Co., finally has found it necessary to curtail. Accordingly it has blown out one blast furnace stack at Gary and one at South Chicago and has turned one stack at South Chicago from pig iron to ferromanganese, on which it will remain for at least two months, supplying this alloy to various corporation users. This reduces active steel plant stacks of the company to 18 out of 27, which is 66.6 per cent in number of stacks, but actually 69 per cent in rated capacity. Due to the present policy of using more direct iron and less scrap than usual, ingot production is at about 65 per cent of capacity.

More British Furnaces Are Idle

Steelworks Also Slowing Down Operations—French and Belgian Pig Iron Competing in Middlesborough—English Producers' Price Reductions Fail To Stimulate Foreign Business—Trade Revival Expected in March

The Iron Trade Review Staff Cable

European Headquarters,
THE IRON TRADE REVIEW,
2-4 Caxton House, Westminster, S. W.

LONDON, Feb. 21.—Fully a dozen northeastern blast furnaces have been blown out. Several iron mines also have been closed, while others are being worked on short time. Most of the Staffordshire ironworks are idle. Seven producers have repudiated their association's figures and have cut the price of bars £2 ($7.90). Fifteen thousand workmen are idle in Sheffield, and the Ebbw Vale Steel works has given notice to 12,000 of its employes that it will lay them off at an early date.

British sheets and billets are quoted below actual cost of production. Good

Sterling—$3.95

French and Belgian pig iron is being offered in Middlesborough at £7 to £8 ($27.65 to $31.60). The price of Derbyshire forge iron has been reduced £1 10s ($5.95) to £10 ($39.50). Recent reductions in the prices of British pig iron and other materials have failed to revive the export business. Belgian billets are quoted at £8 5s ($32.60), Antwerp. Belgian rails are quoted at £12 10s ($49.40) Antwerp.

Steel scrap is selling at £4 ($15.80). The market for galvanized sheets is stagnant, although makers predict an early revival. The demand for tool steel has improved. Steelmakers expect prices of fuel will be lowered, following lifting of government control of coal in March. Steel skelp is offered at £19 ($75.05), and cutting out iron at £27 10s ($108.65).

German steelmakers state that business is being throttled by high wages. They expect an increase of 50 per cent in freight rates. They are unable to meet French or Belgian competition those in a position to know state.

A revival of trading in the British market is expected in March, following the peace conference in London and the reduction in prices of fuel.

British Wages and Prices of Pig Iron Reduced

European Staff Correspondence

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,

BIRMINGHAM, Eng., Feb. 15.—For the first time in several years wages have been reduced in the iron and steel industry. Though the reductions are small they are certain to be followed by much more substantial cuts during the next two months. The bi-monthly ascertainment by the Midland Iron and Steel board provided for a 5 per cent reduction from Feb. 7 until the first week in April. Under the Northern board's finding, a similar reduction is provided and in that case the selling prices are published, the fall in the two months being from £30 8d ($115.62) to £29 10s 8d ($113.70), but the reduction in the north of England still leaves the men's wages 225 per cent above the standard.

These wages are based on selling prices to the end of December, whereas the substantial reductions began in January. The next wage cut is certain to be heavy.

The Cleveland ironmasters have made sweeping reductions in prices. Apparently the stimulus has come from the importation of pig iron from Belgium and Luxemburg. The iron is said to have been sold on the Tees at £8 5s ($31.76) delivered. Another cargo is reported to be on the way. Cleve-

Sterling—$3.85

land manufacturers have reduced their prices an additional £1 ($3.85) per ton, making a total fall of £1 10s ($5.77) per ton to home buyers and £2 7s 6d ($9.14) per ton for export. East coast hematite has been reduced £2 ($7.70) per ton, and for export, £2 10s ($9.62) per ton. This brings down the price of No. 3 Cleveland to £9 15s ($37.54), with £10 ($38.50) for export. East coast hematite becomes £11 ($42.35). Other brands are reduced proportionately. It should be stated that the foregoing figures represent the total fall since Jan. 1, the present reduction being £1 ($3.85) per ton.

The reduction is intended not only to revive export trade but encourage home consumers to place their orders with the blast furnaces. Users have cleared out their stocks, and it is hoped that they will take considerable tonnage. The fall in freights for imported ore has been remarkable. The rate a years ago from Bilbao to the Tees was £1 19s ($7.51) and now is 10 shillings ($1.92) per ton. This has had the very important effect of enabling Rubio ore, which a year ago was selling at £3 12s ($13.85) per ton to be bought at £2 1s ($7.89) per ton, c.i.f. All the furnaces are well stocked with ore, bought at prices considerably higher than those now prevailing.

Foundry coke has been reduced, the Yorkshire brand being £3 7s 6d ($12.99), furnaces, a fall of 17 shillings 6 pence ($3.36). This should be of considerable advantage to the engineering trades.

Several blast furnaces have been shut down at Scunthorpe and Frodingham, in the Lincolnshire district. Other furnaces have been damped down at Barrow, and two in the West Cumberland district. One or two restarts have been made in the Barrow district. The situation is very bad in South Staffordshire, where a whole group of furnaces have been put out of action, including those serving the steelworks of Hickmans, Ltd., one of the largest of the Midland steelworks. The blast furnace of Roberts, Ltd., at Tipton, has been blown out, a notable event in view of the importance of this furnace as a source of foundry iron for a number of engineering establishments in the Birmingham district.

Several of the Northampton and Derbyshire furnaces serving the Staffordshire district are out of action. The pig iron makers feel they have no alternative, with costs at their present high level. The furnaces have deliberately avoided stocking in view of the

Current Iron and Steel Prices of Europe

British Market

Corrected to Date by Cable

Home Market Prices. Gross Tons at Works or Furnace

SEMIFINISHED STEEL

	£	s	d	$
Billets, soft steel	14	0	0	55.30
Sheet bars	14	10	0	57.28
Wire rods	16	15	0	66.16

FINISHED STEEL

Steel bars, England, ¾ to 3-inch	17	0	0	67.15
Ship plates, England	21	10	0	84.93
Ship plates, Scotland	22	0	0	86.90
Beams, England	21	0	0	82.95
Beams, Scotland	21	0	0	82.95
Sheets, black, 24 gage	23	0	0	90.85
Sheets, galvanized, 24 gage	25	0	0	98.75
Rails, 60-lbs. and over	21	0	0	82.95
Tin plate, base box, 108 lbs	1	10	0	5.93
Steel hoops	23	0	0	90.85

PIG IRON*

West Coast Hematite	11	0	0	43.45
Hematite, East Coast Mixed Numbers	11	0	0	43.45
Middlesborough, Basic	9	0	0	35.55
Middlesborough, No. 3	9	15	0	38.51
No. 3 Foundry, Derby, Leicester, Nottingham	9	10	0	37.53
No. 3 Foundry, Northamptonshire	10	0	0	39.50
No. 3 Foundry, Staffordshire	10	17	6	39.01
No. 3 Scotch Foundry	11	0	0	43.45
Ferromanganese 78 per cent	25	0	0	98.75

COKE

Yorkshire furnace	2	15	0	10.86
Yorkshire foundry	3	7	6	13.33

French Market

Prices Last Reported

PIG IRON

	Francs per metric ton (2205 lbs.)	$
Hematite, Lorraine	625	43.75
Foundry, Longwy, No. 2, sand-cast	350	24.50
Foundry, Longwy, No. 2, chill-cast	400	28.00
Foundry, Longwy, No. 3, sand-cast	347	24.29
Foundry, Longwy, No. 3, chill-cast	380	26.60

COKE

French furnace	135	9.45
German, Belgian and British furnace	135	9.45
Same grades for foundry use	200	14.00

SEMIFINISHED STEEL

Blooms	745	52.15
Billets	745	52.15
Sheet bars	745	52.15

FINISHED STEEL

	Francs per 100 kilos (220 lbs.)	$
Merchant bars	90	6.30
Angles	90	6.30
Normal beams and profiles	90	6.30
Plates, bridge and tank, 5 millimeters and thicker	115	8.05
Sheets, black, 3 millimeters	119	8.33
Bars, cold-drawn, 40 to 60 millimeters round	115	8.05

Pig iron prices, are f.o.b. cars at Longwy, Briey or Thionville, according to the schedule of the Comptoir des Fontes; semifinished steel prices, by the Comptoir Siderurgique de France, are delivered at principal consuming centers; finished prices, by the Paris Consortium, are delivered at Paris.

Belgian Market

Prices Last Reported

PIG IRON

	Francs per metric ton (2205 lbs.)	$
Foundry, No. 3, Belgium	400	29.60
Foundry, No. 3, Luxemburg	400	29.60
Basic, open-hearth, Belgium	3.60 to 3.70	26.64 to 27.38
Basic-bessemer, Belgium	3.70 to 3.80	27.38 to 28.02
Basic-bessemer, Luxemburg	...	.....

SEMIFINISHED STEEL

Blooms	500	37.00
Billets	500 to 525	37.00 to 38.85
Sheet bars	550	40.70
Wire rods	675	49.95
*Standard rails	650	48.70

FINISHED MATERIAL

	Francs per 100 kilos (220 lbs.)	$
Merchant bars	60 to 62.50	4.44 to 4.63
Normal beams and profiles	62.50 to 65	4.63 to 4.87
Plates, 5 millimeters and thicker	80 to 82.50	5.92 to 6.11
Plates, 3 to 5 millimeters	...	.....
Sheets, black, 3 millimeters	82.50 to 85	6.11 to 6.29
Plain wire	...	.....
Sheets, galv., 1 millimeter	210 to 212.50	15.54 to 15.73

*Sold on same basis as semifinished material.

All prices f.o.b. furnace or works, except finished material, for which delivered prices are quoted.

probability that the stocks will have to be sold at lower rates than those prevailing when the furnaces were stopped. Foundry demands are likely to be small for some time, the slump gradually extending to this branch of the trade. The roll casters serving the steelworks and especially the South Wales tin plate trade, have had a remarkable run of activity during and since the war, a number of their customers coming from the continent. But this trade now has gone very slack, and the workpeople are on short time. The general foundry industry is in no better shape, domestic castings, in particular, hardly finding any demand.

Apart from pig iron, the reductions are comparatively insignificant. Another drop of £2 ($7.70) has been made in marked or best bars, following a similar reduction a month ago. This makes the selling figure £29 10s ($113.58), as compared with £26 10s ($102.02) for common iron. Orders are few and do not engage more than 30 or 40 per cent of the capacity of the district.

The steel trade shows no improvement, operations being small and intermittent. Most of the work being done in the Birmingham district is by the rerolling mills, which bought heavily of Belgian billets at fairly low prices, and are able to sell their finished bars at about £17 10s ($67.37), a figure quite impossible where English steel, selling at something like £16 ($61.60) is used. The rerollers have captured a large share of the bar trade.

The northeastern steelworks still have some fairly good contracts, but many of the Sheffield and Welsh works are idle.

The galvanized sheet trade continues practically stagnant, although the price has fallen another £1 ($3.85) making the selling figure £27 ($103.95) f.o.b. Secondhand sheets are said to be obtainable at £2 ($7.70) less. The mills in the Midlands have been idle for several weeks, and hardly anything is being done in South Wales. It is reported that American tin plates are being offered at a price equivalent to £1 12s 6d ($6.25), c.i.f. as against the Welsh figure of £1 16s ($6.91). A few inquiries are coming from the continent, but very little work is being done.

Steel scrap has been sold at very low prices. Steel turnings have been sold as low as £1 15s ($6.72) per ton and ordinary steel scrap can be bought from £4 ($15.40) to £5 ($19.25). There is practically no demand for this material at present.

Germans Low Bidders for Locomotives

Staff Correspondence

London, Feb. 10.—Bids have recently been examined in Madrid for about 150 locomotives for the Spanish railways. Builders from all over the world submitted proposals. The German offers are by far the lowest, the American bids being the highest.

On a basis of weight, the average of the German bids was $0.565 per kilogram; British bids averaged $0.654; Belgian bids $0.666, and American bids $0.715 per kilogram.

It seems likely that British builders will get a portion of the business because the German offer was so surprising in some respects as to create suspicion. The German builders represented chiefly by the Henschel, Cassel, Maffei & Hanomag, Hartman and Vulcan firms, offered to extend

credit to the Spanish purchasers for 20 years with a further stipulation that payment could be made in marks at the rate of exchange now prevailing. In other words, the German bid is based on the present depreciated value of the mark in terms of Spanish currency and should the mark improve in value later on, the Germans will accept the loss. It is thought these unusual terms may be due partly to the fact that the German government owes Spain a large sum and hopes to balance the cost of the locomotives against this indebtedness.

American bids were submitted by the American Locomotive Co., Schenectady, N. Y., and the Baldwin Locomotive Works, Philadelphia. The former's bids ranged from $0.628 to $1.005 per kilogram, depending on the type of engine, and the latter's from $0.645 to $0.749 per kilogram, it is reliably reported.

Competition Cuts Into British Exports

European Staff Correspondence

MIDDLESBOROUGH, Eng. Feb. 14.—The predicted fall in the price of British iron and steel is now an established fact. Competition by foreign sellers has to a large extent cut British material out of the export market and the lack of inquiry has resulted in substantial reductions being made in British quotations. In the middle of January steelmakers made drastic cuts of from £2 ($7.70) to £4 ($15.40) per ton. These quotations still left British prices above continental quotations. Beams and angles fell £3 ($11.45); steel rails £2 ($7.70); and billets £4 ($15.40) per ton.

German ship plates are offered at about half the price of British material and pig iron from Luxemburg and Belgium is being delivered in the British home market. The home quotations for hard billets is £16 ($61.60) and steel ship bridge and tank plates £22 ($84.70) per ton.

Pig iron quotations later on followed the downward trend of steel prices. Oversea sellers were offering at £8 5s ($31.75) per ton. This competition necessitated a revision of Cleveland quotations and a first drop of £1 per ton was made. This was followed by a further decline. Additional declines have been registered and it has been intimated the output of iron would be reduced.

Sterling—$3.85

At the first meeting of producers held at Middlesborough in February a further effort was made to meet export conditions. There followed a further reduction of £1 per ton in the export prices of Middlesborough No. 3. foundry, G. M. B. and other qualities dropped proportionately. The February quotations are as follows:

No. 3 Foundry G. M. B.	£ 9 15 0	($37.55)
No. 1 Foundry	10 5 0	($39.45)
No. 4 Foundry	9 14 0	($37.35)
No. 4 Forge	9 12 6	($37.00)

The export premiums, although nominally quoted, have disappeared and it is suggested for firm orders of an attractive nature for export, the home price might be shaded.

Demand for ore is less with the Bilboa-Middlesborough freight at 10 shillings ($1.92). Best Rubio ore is quoted 41 shillings ($7.90) per ton ex-ship Tees. In view of the damping down of blast furnaces by the Tees Furnace Co., Cochrane & Co., and at the Warrenby works of Dorman Long & Co., coupled with the fact that the Cleveland iron ore mines are working only three days a week, ore buyers are holding off. Stocks have been increased at a greater rate than in December when the quantity of ore imported into the Tees totaled 168,277 tons. In January the total ore imported reached 215,957 tons.

The pig iron, manufactured iron, and steel exports from the Tees during January show a slight improvement compared with the total for December. But taking pig iron exports alone they show to how great an extent the shipping of pig iron from the Tees to oversea customers has dwindled. Prior to the war approximately 100,000 tons per month were shipped. The January total is 11,788 tons and of this quantity 5610 tons were delivered to Scotland and to coastwise ports. The actual export shipments were 6178 tons.

Included in the 44,688 tons of pig iron, manufactured iron and steel shipped in January there were 6146 tons delivered coastwise. The total is approximately 10,000 tons above the December shipments and 14,000 above those for November last. Deliveries were made to 25 overseas customers. India continues to head the list of buyers taking 14,479 tons and Germany took 226 tons of pig iron.

Welsh Tin Plate Mills Idle; Trade Is Dull

European Special Correspondence

CARDIFF, South Wales, Feb. 13.—There is little change to note in the Welsh steel and tin plate trades, and no immediate prospect of a revival of business. Many of the works are more or less idle and the unemployment in the trade is growing. The decision to cut the price of steel which has taken place in the Sheffield district in order to encourage business, would not have the same effect here, for the South Wales position is altogether different. It is said that already tin plate has been offered at several shillings below the cost of production and still fails to find buyers. The market view is that even with an improved financial position in middle Europe, the money would be utilized in the purchase of raw materials in order to put the continental factories and workshops in order before the finished product is imported. The market for tin plate is quiet although generally the base price is maintained at around £1 13s per box ($6.25). Odd parcels have been sold at a shilling under, but in view of the high cost of production, according to makers' statements, works are asking for higher prices, even £1 18s to £1 19s ($7.20 to 7.39) per box being named in some cases. Ternes are fairly firm at £1 16s ($6.80) base for the heavy gages, and £1 17s ($6.98) for the lighter plates, f.o.t., but wasters are weaker at £1 8s ($5.28), f.o.t.

Sterling—$3.78

Current quotations are: Cokes, 20 x 14, £1 13s to £1 17s ($6.25 to $6.98); cokes, quarters, £1 16s to £1 18s ($6.80 to $7.20); cokes 28 x 10, £2 9s to £2

11s ($9.26 to $9.65); cokes, 28 x 20, £3 6s to £3 14s ($12.45 to $13.95); ternes, 28 x 20, £3 13s to £3 15s ($13.80 to $14.15).

In reference to the sliding scale arrangement, with the workmen, the executive committee of the Welsh Sheet and Plate Makers' association has suggested that application be made for an early meeting of the Tinplate Joint Sliding Scale committee to deal with the matter as regards the men outside the arrangement, and it is suggested that the 25 per cent special bonus be discontinued and payment made upon the base rate, plus the war bonus percentage and 50 per cent special bonus.

Sheet and tin bars are unchanged at £15 ($56.60) a ton, which is £2 10s under the official minimum of the steelmakers' association.

Galvanized sheets continue to fall in price without attracting buyers, and 24-gage corrugated sheets in bundles can now be got at less than £28 ($105.80), f.o.b. With flat sheets at £29 ($109.50 per ton,) f.o.b., the market is lifeless. English zinc sheets are unchanged at £44 to £45 ($166.10 to $170.) The scrap market remains dull, with plenty of material offering at more or less nominal prices. Heavy melting scrap is £5 10s to £7 10s ($18.90 to 28.30); bundled steel and shearings are £5 10s to £7 ($20.80 to $26.40); mixed wrought iron and scrap for furnace use is £2 to £6 ($7.55 to $22.65); heavy cast-iron scrap for furnaces is £8 ($30.25); odd machinery cast iron is £10 to £10 10s ($37.80 to $39.65), and over.

Austrian, Czech Trade Still Depressed

European Special Correspondence

Austrian Crown—$0.0016

VIENNA, Austria, Jan. 31.—Considerable depression exists in Austrian business circles owing to the failure of the recent Paris conference to offer definite aid, and there is a strong feeling that assistance, if it comes at all, must be from the United States, although the fact is not overlooked that Great Britain already has loaned Austria several million pounds sterling in spite of her sadly depreciated credit. As a sidelight on the present industrial situation, which reflects directly on the iron and steel industry, it is announced that Henry Whitman, an American citizen, has resigned his post as liquidator of the Anglo-Hungarian bank, owing, it is stated, to his feeling that tangible progress cannot be made with the present machinery of the reparations commission sitting in Paris.

In the meantime efforts are being continued to break down some of the artificial economic barriers which have been set up between the new states of Europe. A supplementary agreement was ratified recently between Poland and Austria under which Austria will supply Poland with mining materials, iron and steel, locomotives, cars and electrical material, and Poland takes upon itself to deliver coal and crude oil to Austria.

Iron and steel mills are operating unsatisfactorily but the general engineering shops are doing fairly well with the exception of factories producing agricultural machinery.

It is now reported that a German group of capitalists headed by Hugo Stinnes is negotiating for the purchase of Austrian engineering works which have been operated by the government. When in full working order these plants employ 70,000 men but under government management a deficit was incurred. Although Czech iron and steel works are obtaining better coal and coke supplies than the Austrian plants the amount of business being done by the Czech interests is still far from satisfactory. The chief complaint centers around their inability to export sufficient tonnages. Their business with Austria has considerably declined on account of the depressed conditions in that country and also because Austria is able to buy more cheaply from Germany. In fact, Czech works are now meeting serious competition from German producers for the first time since the war.

The Freistadter Eisen-und-Stahlwerks has made an agreement with the Mannesmann tubeworks in Schonbrunn for the supply of raw materials, chiefly billets and skelp.

Engineering works in Czecho-Slovakia are operating on a reduced schedule. Some factories recently have been obliged to apply to the government to avoid further slowing up of production and the consequent discharge of workmen.

Rumanian orders recently have been disappointing particularly in the agricultural implement field. Business with Poland also is very light.

Czech Crown—$0.01324

Await Price Cuts

On Pacific Coast—Buyers Mark Time For All Products

San Francisco, Feb. 15.—Little improvement is noted in the local iron and steel market. Reports of further reduction in finished material prices by some of the independents have only caused buyers to show added indifference. Some business about to be placed has been held up awaiting developments.

The demand for merchant bars has not increased but the local bar mill operators report a little new business booked. The Pacific Coast Steel Co., the Columbia Steel Co. and the Judson Mfg. Co. are operating their open-hearth plants on old business. Buyers are buying only for current needs.

The market for pig iron is lifeless. Foundries generally have greatly reduced their operations and this fact coupled with the fact they have considerable stocks on hand has made for a listless market. No sales were reported. Chinese pig iron still is being offered at $39, delivered, but with no takers.

While a better tone exists in plates, new inquiries are light and orders few. The Standard Oil Co. closed with an independent for 1200 tons of plates and while no price was given out it has been rumored that the price was considerably under 2.65c, base Pittsburgh. The Southwestern Ship Building Co. recently got a contract for six tankers of the 10,000 and 12,000-ton type and the Union Construction Co. and the Moore Ship Building Corp. are now figuring on new ships.

Little or no business has been done in sheets and inquiries are few.

The scrap market continues at a standstill. A few small lots of heavy steel were sold at $15, delivered. Due to the continued curtailed schedules of the foundries little cast iron scrap has moved. A small order of 100 tons of cast iron car wheels was sold at $27.50.

Important structural shape orders are lacking in this district but a few small awards continue to be made. The Bethlehem Steel Co. recently secured a 1000-ton order for the Junior Orpheum in this city.

A further reduction of 75 cents per 100 pounds on galvanized and black sheets has been announced by local jobbers, galvanized now being 8.75c and black sheets 7.25c.

Join Protest on Ore Rate Raise

Jones & Laughlin, McKinney Steel, and Steel & Tube Co. of America Interests File Additional Protests with Commerce Commission—Tell How Increase Would Affect Them — Lower Lake Tariffs Also in Question

WASHINGTON, Feb. 22.—Further protests against the proposed increases in freight rates in iron ore from the Michigan and Wisconsin ranges to upper lake ports, and also in dock charges, have been filed with the suspension board of the interstate commerce commission by the McKinney Steel Co., of Cleveland; the Steel & Tube Co. of America, of Chicago, and jointly by the Jones & Laughin Ore Co., and the Interstate Ore Co., of Pittsburgh. As in the case of the 36 ore producers represented by Jean Paul Muller, of Washington, suspension of the advances is requested. A decision on these requests is expected from the suspension board on Feb. 23 or 24.

The joint protest of the Jones & Laughin Ore Co., and the Interstate Ore Co., is directed at the Duluth, South Shore & Atlantic; Munsing, Marquette & Southeastern; Chicago & North Western, and Chicago, Milwaukee & St. Paul railroads. Tariffs filed by these four carriers, effective on March 14 in case of the first two, and on Feb. 25, in case of the last two, would affect shipments of iron ore from the Marquette and Menominee ranges to Marquette and Escanaba, the increase to Marquette being 10 cents a ton and to Escanaba 15 cents. The joint protest says in part:

"The Breitung property near Negaunee is the largest of the several operations that would be affected and the one on which the proposed advances would have the most vital effect. The Interstate Iron Co., within the past six weeks has purchased in whole or in part the Breitung iron ore property, consisting of approximately 1500 acres of ore lands. The Breitung property, there being three operating mines at present, have heretofore been worked only to a limited extent. It is the intention to mine and ship a very substantial quantity of ore yearly, beginning with the coming season. The purchaser of that ore is the Jones & Laughlin Steel Co., whose requirements are approximately 3,600,000 tons per year; and one of the reasons for the acquisition of the Breitung property was to have it as one of the main sources of ore supply for that company.

"The best opinion in the trade is that the total ore requirements during the coming season will not show any marked increase over 1919 and 1920. In these circumstances, the total production will be considerably lower than the total capacity of the mines. As a necessary business consequence of an advance in rates from the Marquette and Menominee ranges, the production and shipment will seek other fields amply capable of supplying the requirements. This consequence becomes the more probable in view of the fact that the larger consumers of ore control ore properties in all or several of the ranges. The protestants herein, for example, together with the Leetonia Mining Co., have heretofore supplied the Jones & Laughin Steel Co. from nine different operations in the Mesabi range, from which no rate advance is proposed.

"If the proposed advance is principally a revenue measure, it is likely, with the present outlook for the coming season's production, to defeat its purpose by driving tonnage to other districts and to other roads."

The McKinney Steel Co.'s protest is against proposed advances by the Chicago, Milwaukee & St. Paul, and the Chicago & North Western railroads on ore from the Menominee and Gogebic ranges to Ashland, Wis., and Escabana. Both roads would increase the dock charges 5 cents a ton, and the rates from the ranges to the ports 10 cents a ton, effective Feb. 25.

The Steel & Tube Co. of America's request for suspension of the proposed increases deals with the movement of iron ore from the Gogebic, Marquette and Menominee ranges to Ashland and Escanaba, on the Chicago & North Western and Minneapolis, St. Paul and Sault Ste. Marie railroads. The tonnage of iron ore in which the company claims an interest is in excess of 2,300,000 tons a year, it is stated and the proposed increases would affect some 2,000,000 tons and burden the company.

Pushes Eastern Ore Case

Exceptions have been filed with the interstate commerce commission by the Wharton Steel Co., Wharton, N. J., as a result of the decision of the commission's examiner in the steel company's action against the Pennsylvania railroad. The recommendation of the examiner was that the freight rates on iron ore from New Jersey mines to eastern blast furnaces were not prejudicial and unreasonable in themselves, but were unreasonable as compared with the rates on ex-lake ore to eastern furnaces. Says the Wharton Steel petition:

"We submit that we are entitled to a finding of undue prejudice against the rates on iron ore from Ringwood and Wharton and unlawful preference in favor of the rates from Port Henry and Elizabethport as well as from the lower Lake Erie ports. We also are of the opinion that in view of the fact that the iron ore rates from the Ringwood and Replogle mines are almost equal to and in many cases greater than the rates on the finished product, pig iron, and are constructed unscientifically and contrary to well-accepted principles of ratemaking, we are entitled to a finding of unreasonableness as well as undue preference and undue prejudice."

Were the interstate commerce commission to accept the recommendations of the examiner, an adjustment of freight rates on iron ore eastward from lower lake ports would follow as a natural sequence, and this in turn might lead to a general revision of lower lake ore freight rates.

A decision by the interstate commerce commission in the case of the Jones & Laughlin Steel Co., of Pittsburgh, against the Aliquippa & Southern railroad and the federal railroad administration makes the Aliquippa & Southern a common carrier and finds rates to and from plants of the complainant at Woodlawn and West Economy, Pa., to have been and to be unreasonable and unduly prejudicial. To the extent that the charges collected by the Aliquippa & Southern exceed those that would have accrued to it on the basis of fair and reasonable allowances or divisions of joint rates reparation is granted.

Japan Buys Freely

Washington, Feb. 22.—Japan continues to be a good customer of the iron and steel and metal-working industries of the United States. The extent of this trade between Japan and the United States may be seen from the following compilation of some of Japan's metal imports from the United States in December, the latest month for which foreign trade figures are available:

Refrigerating machinery, $206,642; pumps and pumping machinery, $60,820; steam locomotives, five valued at $33,500; structural iron and steel, 5579 tons valued at $418,658; air-compressing machinery, $55,606; tin plates, terne plates and taggers tin, 4,251,880 pounds valued at $332,339; car wheels and axles, $50,904; parts of railroad cars, $56,054; railway spikes, 249,862 pounds valued at $11,704; steel rails, 3466 tons valued at $201,537; and switches, frogs, splice bars etc., $30,502.

Engineers Discuss Steel Topics

Metallurgists Consider Chemical and Physical Properties of Iron and Steel at Meeting of Mining Engineering Organization—Exhaustive Information on Drill Steel Collected—Discuss Problems of Industrial Relations

IRON and steel topics played an important part in the winter meeting of the American Institute of Mining and Metallurgical Engineers, Feb. 14-17, at the Engineering Societies building, New York. Two sessions on Tuesday were devoted entirely to the discussion of subjects touching upon the metallurgy and manufacture of iron and steel, while on Wednesday two sessions were devoted to the presentation of detailed information on the breakage and heat treatment of drill steel. The discussion on this subject led to a number of important phases of the manufacture of drill steel and resulted ultimately in a resolution to the effect that the American Institute of Mining and Metallurgical Engineers establish a board in cooperation with other engineering societies and government agencies to investigate the breakage and heat treatment of rock drill steel and other steels subjected to similar stresses. This resolution was unanimously adopted and will go to the board of directors of the institute for action.

Another subject which received attention during the meeting was that of industrial relations, one entire session and parts of others being devoted to employment and welfare problems. Other topics discussed during the meeting dealt with nonferrous metallurgy, nonmetallic minerals, mining and milling, coal mining and petroleum and gas.

The annual banquet was held at the Waldorf-Astoria hotel last Wednesday evening. W. L. Saunders, Ingersoll-Rand Co., New York, presided as toastmaster. Herbert Hoover, retiring president of the institute, delivered a brief address devoted almost entirely to a review of the activities of the organization during the past year. Edwin Ludlow, New York, incoming president, emphasized the importance of the labor problem.

Discussion on Drill Steel Involves Fatigue Tests

A YEAR ago the outstanding feature of the February meeting of the institute was the wealth of authoritative information presented at sessions on the stabilization of the coal industry. This year a similar abundance of valuable material was brought to light in the Wednesday sessions on the breakage and heat treatment of drill steel. Although less than 50 men were present at the discussions of this subject, they attacked the problem from all sides, and presented what is easily the most comprehensive array of information that ever has been collected on the subject.

The discussion centered upon a proposed research to be undertaken by the institute in connection with the United States bureau of mines, American Society for Steel Treating and the engineering division of the National Research council. At the conclusion of the morning session, upon the recommendation of Van H. Manning, director of the American Petroleum institute, it was unanimously decided to request the board of directors of the American Institute of Mining and Metallurgical Engineers to appoint a committee to investigate the breakage and heat treatment of rock drill steel and other steels subjected to stresses similar to those encountered by drill steel. As a result of several amendments to the original motion, it was decided that the following organizations be "among those agencies invited to co-operate and participate in the investigation:"

American Society of Mechanical Engineers, American Society for Testing Materials, American Institute of Civil Engineers, American Petroleum institute, American Society for Steel Treating, American Welding society, Engineering Foundation, National Research council, Tool Steel society, United States bureau of standards, United States bureau of mines, Mining and Metallurgical society and Association of General Contractors of America.

Outlines Breakage Problem

Benjamin F. Tillson, New Jersey Zinc Co., Franklin Furnace, N. J., who presided at both sessions, outlined the problem of breakage and heat treatment in a thorough manner, touching on the causes of failure, methods of testing properties of drill steel, nature of failure, correlation of field tests with accelerated laboratory tests, and the reclamation of depreciated drill steels before and after failure. Many of the points suggested by Mr. Tillson were discussed in detail in papers presented by a number of speakers representing the mine organizations, government bureaus and steel manufacturers.

In the discussion which followed, J. W. Richards, Lehigh university, Bethlehem, Pa., declared that the question, "Why Do Drills Break?" is fundamental, and should be answered before other problems are attacked. At his suggestion, H. F. Moore, University of Illinois, Urbana, Ill., presented an informal sketch of the progress being made in the study of the fatigue of metals. Professor Moore's brief outline doubtless was one of the most concise statements yet given on the important subject of fatigue.

The tests thus far made at Illinois, explained Professor Moore, have been devoted to materials subjected to stresses without impact. They show that steel under repeated applications of positive and negative stresses will fail at a clearly definite stress which seems to have no relation to the elastic limit of the metal. Professor Moore stated that there are three theories on the fatigue of metals. The first and oldest is based on the view that crystallization occurs under repeated stress and that the change in structure of the metal causes failure. The speaker declared that he never has found evidence to support this theory. The second theory is based on the assumption that some inherent property of the metal changes under repeated stress, while according to the third theory fatigue of metals is the spread of damage from minute breaks or defects. Professor Moore said that he has yet to find a case which cannot be explained by this theory. It has been possible to subject annealed homogeneous steel to 100,000,000 reversals of stress without failure, while alloy steel with little or no drawing has failed at a stress amounting to only 58

per cent of its normal elastic limit.

Applying the third theory to the drill rod problem, the speaker stated that in his opinion, drill steel contains small incipient cracks, which develop into larger ones under repeated stress, until failure occurs.

H. M. Chance, mining engineer, Philadelphia, declared that there is a tendency to use drill steel which is entirely satisfactory when properly heat treated but which becomes worthless unless handled carefully. It is the policy in many places to use this kind of steel and to "nurse it along." He advocated the use of the best steel that can be produced, believing that such material cannot easily be spoiled when placed in the hands of careless mine blacksmiths.

In the afternoon session, Charles W. Burrows presented an illustrated description of a rough test which had been made on ⅛-inch drill rod. The rod was held vertically between a drill holder and a steel plate resting on a solid anvil. The failures in the rod occurred at points several inches from the top of the shank and from the bit. From the study of the performance of rods under test it is evident that they suffer body displacement and that a vibratory motion is set up which subjects certain parts of the rod to alternate tensile and compression stresses. Tests showed that under certain conditions there are 350 reversals of stress for each blow of the hammer. The speaker also explained the study of the structure of materials by means of a magnetic deflectoscope, which reveals structural defects in metals electrically. W. T. Ober, Thomson Spot Welding Co., Lynn, Mass., read a paper describing the method of welding broken drill rods by means of spot welding process. E. W. Wanamaker, Chicago, Rock Island & Pacific railroad, and Mr. Sheffer, American Car & Foundry Co., discussed the welding of drill steel by the electric arc process. It was pointed out by Mr. Tillson and George T. Cousins, Ingersoll-Rand Co., New York, that the time element enters into the problem of welding. Mr. Cousins stated that in many instances drill rod of too small section is being used because mine operators are not disposed to undergo the temporary inconvenience caused by changing from obsolete sizes. Improper support for drills was mentioned as a contributing cause of breakage.

Problems of Furnace Operation Receive Attention

PROBLEMS encountered in blast furnace and electric furnace practice received attention at the Tuesday morning session on iron and steel, at which J. W. Richards, Lehigh university, Bethlehem, Pa., presided as chairman. R. S. Reid, Semet-Solvay Co., Ashland, Ky., presented a paper on the measurement of blast furnace gas, which had been prepared in conjunction with D. L. Ward, Federal furnace plant, By-products Coke Corp., South Chicago, Ill. In this paper the authors describe a method of measuring the flow of gas from two furnace stacks at the Federal plant at South Chicago. The pitot tube and venturi tube were considered, but were found to be unsatisfactory on account of the dust in the gas and the lack of sufficiently long runs of straight gas mains to accommodate a tube of the required size. The instrument eventually accepted is a plate with a sharp edged orifice possessing all of the characteristics of a venturi tube and requiring less space and being much easier and cheaper to install. Moreover, according to the authors' calculations, the flow of gas as measured by this instrument checks very satisfactorily with the results obtained by calculating the gas yield of the furnaces, according to the formula developed by J. W. Richards.

In the discussion, J. W. Richards asked if this method had been applied to the other side of the furnace to measure the volume of blast from the blowing engines. He stated that blast furnace operators are in need of more definite knowledge regarding the amount of blast furnished and that thus far, with the exception of a recording apparatus attached to a motor driven blowing engine, there is no method of determining the volume of air supplied to the tuyeres. There also was some discussion upon the value of the pitot tube in measuring gas. Professor Richards stated that his experience has indicated that readings taken with the tube on dusty gas vary as much as 50 per cent. It was the consensus of opinion among those who discussed the subject that the pitot tube is unsatisfactory for this purpose.

Emphasizes Importance of Coke Hardness

Owen R. Rice, blast furnace department, Bethlehem Steel Co., Bethlehem, Pa., read a paper on the importance of the hardness of blast furnace coke. This paper was published in full in the Feb. 10 issue of THE IRON TRADE REVIEW. In the discussion which followed, Dr. Richard Moldenke, Watchung, N. J., emphasized the need of controlling the hardness of coke and discussed briefly the problem as it affects the operation of the cupola. C. R. Meissner, Seaboard By-products Coke Co., Jersey City, N. J., took exception to Mr. Rice's statement that the harder the coke, the better are the operating conditions of the furnace. He stated that Mr. Rice is correct in this statement, insofar as it pertains to 500-ton stacks, similar to those of the Bethlehem company, but declared the conditions in some of the smaller stacks are such that there is danger in obtaining coke which is too hard. Coke which has excessive strength may affect the blast in a manner tending to produce unsatisfactory results, according to Mr. Meissner. In reply to several questions, Mr. Rice explained in detail how samples are obtained from cars of coke to determine coke hardness. Prof. Richards suggested that cokemakers should be interested in a method of test which would enable them to control coke hardness and thus give their customers the kind of coke required by the particular furnace conditions obtaining in their respective plants.

A paper on the manufacture of ferromanganese in the electric furnace by Robert M. Keeney and Jay Lonergan was read by the former. In this paper the status of the ferromanganese industry in the United States is briefly traced from the year 1914 up to the present time. The principles of electric smelting of iron ore are outlined and a comparison between electric and blast furnace smelting is drawn.

A paper entitled "Electric Furnaces in the Iron Foundry" was read by Dr. Richard Moldenke, Watchung, N. J. Doctor Moldenke touched upon the large amount of high sulphur scrap which will return to the foundries in the United States in the next 20 years, due to the high sulphur castings produced during the war. This accumulation of unsatisfactory material would be alarming, he stated, if it were not for the fact that the electric furnace will enable foundrymen to dilute this high sulpur without resorting to the expensive expedient of using low sulphur pig iron. The latter part of the paper is devoted to a discussion of the use in the electric furnace in conjunction with the cupola. The author believes that within the next five or 10 years the gray iron foundries of the country will discard the present system of once-a-day pouring and will adopt

the continuous system, which can most easily be established by adopting the duplex process of melting. The chairman read a written discussion presented by George K. Elliott, Lunkenheimer Co., Cincinnati, in which Mr. Elliott referred to his experience with the electric furnace in making iron for valves which were to be subjected to high pressure. He emphasized the ability of the electric furnace to heat iron to high temperatures required for intricate work and also mentioned the ease with which sulphur can be brought to low percentages. In fact, according to Mr. Elliott, it is relatively easy in the electric furnace to bring the sulphur content to a point much lower than is commercially advisable.

Discuss Nitrogen in Steel

The afternoon session was devoted to papers on the chemistry and physical properties of steel. H. E. Wheeler, Chicago, is the author of a paper entitled "Nitrogen in Steel and Erosion of Guns," which was prepared for the Lake Superior meeting of the institute held in August, 1920. F. L. Comstock, Titanium Alloy Mfg. Co., Niagara Falls, N. Y., discussed this paper, taking exception with Mr. Wheeler on some of his remarks regarding the detection of nitrides in photomicrographs. He illustrated his remarks by means of slides showing instances where pearlite and other phenomena resembled nitrides when etched by certain reagents. O. A. Knight, Watertown arsenal, Watertown, Mass., referred to tests made several years ago showing that nitrogen plays an important part in the erosion of guns.

H. M. Boylston, professor of metallurgy, Case School of Applied Science, Cleveland, abstracted a paper on "Static and Dynamic Tension Tests on Nickel Steel," by J. J. Thomas and J. H. Nead.

Dr. C. K. Burgess, United States bureau of mines, Washington, D. C., abstracted a paper entitled "Surface Changes in Carbon Steels Heated in Vacuo," by E. Heaton Hemingway and George R. Ensminger. Prof. J. W. Richards presented an excellent abstract of an important paper entitled "Chemical Equilibrium Between Iron, Carbon and Oxygen," written by A. Matsubara, assistant professor of chemistry, Kioto Imperial university, Japan.

P. A. E. Armstrong, Ludlum Steel Co., Watervliet, N. Y., drew a comparison between Swedish and American drill steel, pointing to the fact that the metal surrounding the hole in the Swedish material is decarbonized while the steel in the American product is uniform from interior to exterior. It would be expected that the homogeneous material would resist breakage better than the steel with the decarbonized center, yet it is a fact that the Swedish steel stands up as well as the American. Mr. Armstrong explained the Swedish method of making drill steel and showed that the decarburized center is incidental to the process rather than the object sought.

He reviewed the making of American drill steel, concluding with the description of a novel method employed by the Ludlum Steel Co. The metal is poured into 7-inch ingot molds around a 2-inch tube which has been set vertically in the center of the mold. The Tube or core is filled with lime.

Describes Early Experiments

R. M. McDonnel Crucible Steel Co. of America, described the standard practice of making drill steel, stating that 50 per cent of the ingot is discarded in order that imperfections are eliminated from the product when finished.

In a paper on molybdenum steels, John A. Mathews, president, Crucible Steel Co. of America, Pittsburgh, referred to the early investigations of the properties of molybdenum in America and pointed to the similarity of results obtained 20 years ago with those recently announced. His paper appears practically in full on page 547 of this issue. J. D. Cutter, Climax Molybdenum Co., New York, discussed Doctor Mathews' paper as follows:

"It is especially gratifying to note the clear line of demarcation which the author has drawn between the action of molybdenum in tool steels and in structural steels.

"In his discussion of the characteristics of molybdenum structural steels, Doctor Mathews has covered all of the outstanding qualities of these steels which have come under the observation of the writer except perhaps the fact that such impact tests as have been made have been favorable. Doctor Mathews believes that these steels will not entirely replace any of the older alloy steels and that their role will rather be to supplement and enlarge the sphere of usefulness of alloy steels in general. It is certain that no one is prepared to make a statement to the contrary. An illustration is found in the apparently marked adaptability which some types of molybdenum steel have exhibited for sheet metal parts such as automobile frames, axle housw would be a good thing if the movement toward standardization of steel specifications be carried a step further and a single type of alloy steel be ings, rims, etc.—a field in which the other alloy steels have not played a very prominent part.

"In this connection, however, the thought presents itself that perhaps it agreed upon as standard. Of course, such a standard would only apply for general purposes. There are many special cases where the fitness of a particular type of steel is unquestioned. It seems apparent, however, that widely differing types of steel are now being used to meet almost identical conditions and that the preference of steel users for this or that type of alloy steel is often not based on fundamentals. The writer does not think that the time is ripe for such a move but offers this idea as a possible development of the future."

Co-ordinating Work of Employment Department

PROBLEMS involved in the employment of industrial workmen and in accident prevention and welfare work received attention at a special session on industrial relations held Wednesday afternoon, and also at a morning session on the same day at which the reports of sub-committees on various phases of industrial relations were heard.

One of the features of the meeting was the showing of the film entitled "Why?", prepared under the direction of the safety committee of the United States Steel Corp., and presented under the auspices of the industrial relations committee of the institute. In this film, two new workmen, just employed in a steel mill, are shown with a representative of the employment department who shows them the dangers of the work in which they are about to engage, and explains the purpose of many safety devices. The picture makes a strong appeal because it indicates that in spite of the careful attempt made by the company to warn these new men against accident, the natural tendency is to disregard precaution.

The committee reports presented Wednesday morning included those on industrial housing, education, accident prevention, prevention of sickness, etc. The paper of most general application presented at the afternoon session was that read by H. S. Rectanus, American Rolling Mill Co., Middletown, O., who discussed the hiring and placing of men. In this paper, which will be published in full in a later issue of THE IRON TRADE REVIEW, the author emphasizes the need of co-ordinating the work of the employment department so that the foremen are not deprived of jurisdiction over their men.

Molybdenum Steel Gives Service

Newer Types of Steels Containing This Element Are Finding Diversified Uses in the Automotive and General Engineering Fields—Metal May Be Reclaimed from Scrap in Open-Hearth Furnaces

BY JOHN A. MATHEWS

IT is 20 years since the writer first made molybdenum steels. Others were making them commercially five years earlier but the prevailing opinion seems to be that molybdenum steels are new. The first experiments were largely confined to the use of relatively high percentages of molybdenum in tool steels and permanent magnet steels. Recent developments deal with the types of alloy structural steels used for airplane, automobile, and other engineering requirements. In these, the molybdenum content is usually less than 1 per cent. The earlier types generally have been unsuccessful commercially, but the newer steels are becoming more important.

The war showed the dependence of America on foreign sources for alloying metals; molybdenum alone is widely distributed in the United States and seemingly abundant. Many deposits are not now of commercial interest, owing to location and relatively small amount of ore available, but other deposits are being developed and a stable source of supply seems well assured.

Use In Magnet Steels

In tool and magnet steels, it was early found that 1 part of molybdenum was equivalent to from 2 to 2.5 parts of tungsten. The permanent magnet steels investigated by Madame Curie in 1898 contained from 3.36 to 4.05 per cent molybdenum; in 1902, Dr. E. L. French and the writer thoroughly tested steels containing from 2.0 to 4.0 per cent. These steels gave satisfactory tests for permanence, but were low in residual density and much more sensitive to hardening than the corresponding tungsten products. We discontinued work with them, therefore, and have no advice that such steels have been used commercially here or abroad.

Prior to the development of the Taylor-White process and the modern high-speed steels, air-hardening steels were in general use. These were high in carbon and usually contained tungsten and chromium, the latter having replaced the manganese of the original Mushet air-hardening steels. Later, the tungsten content was frequently replaced by molybdenum. An air-hardening steel largely used had the following analysis: Carbon, 1.75 to 2.00; molybdenum, 3.75 to 4.25, and chromium, 3.75 to 4.25 per cent.

In the earlier years of the twentieth century, high-speed steels quickly displaced the air-hardening steels. Most of the manufacturers confined their efforts to tungsten-chromium combinations, but in America determined efforts were made to use molybdenum instead of tungsten. At the time that one European metallurgist was claiming that steel containing over 6 per cent molybdenum could not be rolled, we were commercially rolling large quantities of a steel containing over 9 per cent molybdenum and had successfully rolled steel containing up to 15 per cent. The use of molybdenum above 6 per cent was patented in the United States, as was the use of vanadium with either tungsten or molybdenum in high-speed steel. So far as molybdenum was concerned, the manufacture of these steels was discontinued almost before the patents had been allowed. One of these patents has now expired, but "discoveries" of chrome-molybdenum-vanadium steel and molybdenum-vanadium steel for high-speed purposes were recently announced. Both of these types of steels were made and abandoned nearly 20 years ago, as they were found, after exhaustive experiments and tests, to be unsatisfactory both to manufacturer and in use. Occasionally these steels gave extraordinarily good service, as measured by the standards of that time, which were much below the present standards of the leading high-speed steels. However, notwithstanding the discouraging results of the earlier experiments, the writer has felt that some time we should have to use molybdenum, due to shortage of tungsten, or for other economic reasons, and from time to time during the past 20 years we have repeated our experiments with these steels, with the hope that the general advancement in the art of manufacture might help overcome the earlier difficulties and objectionable features.

One of the principal difficulties with molybdenum in high-speed steel is its tendency to volatilize at the high temperatures necessary in the working and hardening of the steel. Indeed, it is possible to detect high molybdenum steels under the hammer by the light yellow smoke arising.

After prolonged or excessive heating, a well-defined zone on the outside of the bars or tools is entirely different from the interior in structure, and as a result, finished tools, such as drills and cutters, which cannot be given the grinding permissible with lathe tools are not satisfactory; this has greatly limited the use of molybdenum high-speed steels. Both vanadium and cobalt have been tried in an endeavor to overcome this difficulty. Recently it was stated that cobalt and vanadium are "stabilizers" for molybdenum, but the writer has seen no evidence to confirm these claims. On the other hand, molybdenum high-speed steel containing either or both of these elements has shown the defect in a marked degree. Some experiments now in progress promise more satisfactory results but it has not been determined whether the "stabilizer" in any way impairs the cutting qualities.

Literature on Molybdenum Steels

For the modern developments in the use of molybdenum, we are greatly indebted to C. Harold Wills, of Marysville, Mich. Having become convinced that there was abundant ore in this country, he experimented with molybdenum in a great variety of combinations. Much has been published regarding the physical properties and suggested types of molybdenum-alloy steels but we would refer to the papers by Dr. Geo. W. Sargent, J. D. Cutter, and Chas. McKnight, Jr., and booklets published by the Climax Molybdenum Co. and the Crucible Steel Co. of America. While much of this material is propaganda, it is based on experiments made in the laboratories and plants of the Crucible Steel Co., and in those of the Carbon Steel Co., United Alloy Steel Co. and by Messrs. Wills and Chandler, formerly with the Ford Motor Co. The paper by Doctor Sargent refers to the work of Guillet, Saladin, Swinden and Giolitti in reference to prior use and manufacture of chrome-molybdenum steels of somewhat similar types to those in which interest is now centered. Mr. Cutter's paper proposes the use of a merit index for the comparison of different steels, and makes use of a formula in which the elastic limit, ultimate strength, elongation and reduction are all considered.

In the mills, molybdenum steel has been found to work satisfactorily, being relatively as free from seams and sim-

From a paper presented at the annual meeting of the American Institute of Mining and Metallurgical Engineers, New York, Feb. 14-17. The author, John A. Mathews, is president, Crucible Steel Co. of America, Pittsburgh.

ilar defects as the older types of alloy steels; it is also freer from thick and tenacious scale than are the nickel and chrome-nickel types. It seems to flow readily, particularly in drop forgings, and can be worked over a wide range of temperature, say from 2100 degrees to 2500 degrees Fahrenheit, though the higher temperature would not be recommended for steel containing above 0.25 to 0.30 per cent carbon.

The steel seems to have a wide safe heat-treatment range, as measured by static tests. But it is not advisable to stress this point as it leads to carelessness in heat treatment. In addition, it has been found that static tests are somewhat misleading in this regard. While many steels of high quality can be forged or heat treated through a considerable range of temperature without apparent loss in static qualities, dynamic or shock tests to indicate that for every steel there is a temperature at which the maximum of static and dynamic qualities are obtained. Shock-test methods in this regard are of especial value in supplementing our knowledge of materials or even in detecting faulty heat treatments that static tests do not show. Molybdenum steels seem to machine more readily at a given Brinell hardness than do other steels. This would mean, of course, that parts that must be heat treated and machined afterwards could be utilized in a state showing higher physical properties than have been customarily obtainable. The physical property on which molybdenum seems to exert most effect is the reduction of area, which is usually considered a good measure of toughness.

Has Property of Deep Hardening

Molybdenum, particularly in conjunction with chromium, seems to confer the property of deep hardening. This is to be expected from the observation that molybdenum steels resist the drawing temperature to quite an unusual degree. In other words, they require a higher drawing temperature to reduce the physical properties by the same amount that they would be reduced in similar steels without the presence of molybdenum. This indicates that molybdenum tends to keep the carbon in steel in the combined or martensitic form, and when in that condition to retard its passage to the sorbitic or troostitic state. Some years ago the writer sent to Prof. H. C. H. Carpenter, then at the National Physical Laboratory of Great Britain, a chrome-molybdenum steel together with a variety of commercial high-speed steels for use in his investigations upon the drawing or softening of hardened high-speed steels. This particular steel contained but 4 per cent molybdenum, 3 per cent chromium, and about 0.47 per cent carbon, yet it resisted the drawback temperature, as measured by Professor Carpenter's etching method, to a greater extent than any of the commercial tungsten high-speed steels used by him, whether of American or British manufacture.

It is possibly too early to make predictions, but the writer believes that molybdenum has established for itself a permanent place among the alloy steels found useful to the airplane, automobile and general engineering trades. It will not wholly displace any other type of steel, but the effect of improvements of this kind and new products has been rather to extend the field of usefulness than to eliminate products of previously demonstrated merit. The bessemer and open-hearth processes and the electric furnace have not displaced the original crucible cast steel business. The demand for steels made by each method has arisen with the process itself.

Not only does molybdenum below 1 per cent give no trouble from volatilization, but it may be recovered from scrap when remelted in the open-hearth furnace to a large extent.

Discuss Boiler Code

The first annual meeting of the National Board of Boiler and Pressure Vessel Inspectors which was held at the Hotel Statler, Detroit, Feb. 2-4 was attended by about 60 men, including members of the board, members of the boiler code committee of the American Society of Mechanical Engineers, and others interested.

Dr. D. S. Jacobs, acting chairman of the boiler code committee and Charles E. Gorton, chairman of the American Uniform Boiler Law society explained the early history and development of the organizations now engaged in working for a uniform code. E. R. Fish, vice president of the Heine Safety Boiler Co., St. Louis, explained the advantage of a single stamps for boilers constructed in accordance with the code. S. F. Jete, chief engineer of the Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn., spoke upon the advantages of uniform qualifications for boiler inspectors. F. R. Low, editor of *Power*, outlined some of the possibilities, opportunities and responsibilities before the board, while J. C. McCabe, chief inspector of boilers for the state of Michigan, spoke of the qualifications and duties of boiler inspectors.

On the second day the members of the board attended a meeting and took part in the deliberations of the boiler code committee. Joseph F. Scott, inspector from New Jersey, is to continue as chairman of the national board and C. O. Myers, of Ohio, as secretary-treasurer.

To Unify Specifications for Wire and Cable

That the unification of specifications for wires and cables for other than telephone and telegraph use should be undertaken under one general plan, covering substantially all the more important uses, was the unanimous conclusion of a conference recently held under the auspices of the American engineering standards committee at the instance of the American Railway Engineering association and other national organizations. Nearly a dozen organizations now have publications on the subject and it was agreed that the proposed work should be a unification of the specifications and standards already in existence rather than an attempt to formulate entirely new standards, except in fields not already covered. It also was decided that to promote export trade it would be desirable to have all American wire and cable standards assembled in a single book, in the same manner as already has been done by the English and Germans.

Welding Hose Colors Are Given Attention

To define their stand in the question of changing the identification colors for oxygen and acetylene hoses and regulators the executive board of the Compressed Gas Manufacturer's association recently passed a resolution as follows:

"Resolved, whereas, although it would have been a good thing for the industries if red had been adopted as the color for combustible gases at the inception of the business, grave results might follow such adoption at this time, we therefore feel that it is desirable to go on record as against the changing of colors now in general use."

The movement was in accordance with that made by the National Board of Fire Underwriters which in its 1910 edition of rules and requirements states:

"In order to avoid confusion when attaching the hose to the connections a red colored hose should be used for oxygen and a black colored hose for acetylene."

An attempt was being made to have the order reversed on the ground that red should denote the hose carrying the most dangerous gas.

Fig. 1—The New Haven plant from the Dixwell avenue side. The map shows the route over which the equipment was trucked

Moves Plant Equipment by Truck

Car Lighting Appliance Manufacturer Ships Units of New Jersey Shop to New Haven. 85 Miles—Operations Continue in Both Plants while Machinery Is Being Transported—Demand Prompts Move

BY HERBERT R. SIMONDS

AN IMPORTANT use of motor truck transportation was recently seen in the moving of the plant of the Safety Car Heating & Lighting Co. from Jersey City, N. J., to New Haven, Conn. The entire operation was performed quickly, work at the new plant being started before operations ceased at the old one, affording partial production continuously throughout the moving program.

The distance from Jersey City to New Haven is approximately 85 miles and the difficulty of making the move without some use of motor trucks is hard to conceive at the present time when this form of transportation is becoming so much a matter of everyday business. Even with the use of trucks at both ends of the trip the uncertainties of railroad freight service have made impossible the moving operation on anything like the schedule carried out. With trucks used the entire distance, the procedure was rereduced to the simplicity involved in moving from one part of a city to another, the only difference being an added day's time during transit.

Transportation by truck has been thrown into competition with railroad freight a great deal during 1920. Its limitations and advantages are fairly well understood by the average shipper. There are, however, few cases where a manufacturing plant is picked up and transported to a distant city, and therefore the problems involved and advantages of one method over another in such a move are less familiar.

The Safety Car Heating & Lighting Co. earlier in the summer saw that its business was rapidly outgrowing the facilities at Jersey City. Congestion at the site of its plant there made expansion difficult and investigation of available sites brought to light the plant of the Marlin-Rockwell Co., on Dixwell avenue, New Haven.

This is a plant which attracted considerable attention during the war, first, through its rapid construction and secondly through its use in the manufacture of Browning guns. A survey of the property by the Jersey City company officials proved its fitness as a new home for their expanding enterprise. The plant therefore was purchased and plans started for moving. During all of this time the demand for the company's product was increasing and the Jersey City plant was becoming more and more congested. Consequently the importance of a minimum loss in production through moving the plant was great and plans for the entire operation were carefully made. The first step was to lay out in detail the

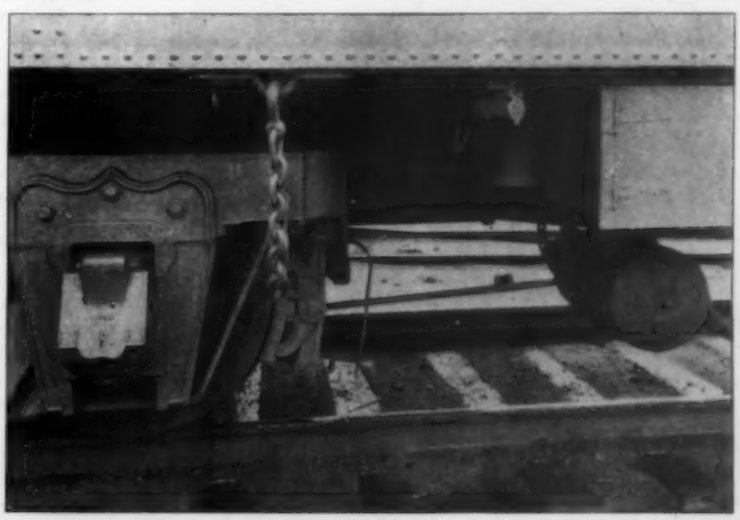


FIG. 2—THE GENERATOR IS BELT DRIVEN FROM ONE AXLE AND THE VARYING DISTANCE BETWEEN PULLEY CENTERS IS TAKEN UP BY SPRINGS

shop arrangement at New Haven. When this plant was taken over its former equipment had been completely removed with the exception of some overhead shafting and lighting fixtures so that the shops were to all purposes the same as if newly built and unused. The main building contains a machine shop, storage room and offices. The machine shop is 378 feet long and 105 feet wide built with brick walls, steel frame and wood roof. This building complete with a 35 x 163-foot ell was started Jan. 1, 1918, and was finished in 40 working days. It was built by Fred T. Ley, Inc., Springfield, Mass. Fig. 3 shows the machine shop during the time of the recent moving of equipment from New Jersey to New Haven. Soon after the photograph was taken the room was transformed into a well equipped shop with machine tools properly located for efficiency in production of the company's product.

The work of moving equipment was performed under the direction of J. C. Montgomery, superintendent of shops. As soon as the layout of machines in the new plant was determined the work of shipping the tools from the old plant was started. The plan was to take single machines for different purposes first, so that a new unit of production on a small scale would be established at the new plant before the old system had been seriously interfered with except as to capacity. For example, where there were three machines engaged on a certain operation in the old plant, one of these would be taken out and set up in the new plant before the others were disturbed. By the acquisition of the new plant increased production was planned and this of course meant the purchase of considerable new equipment which greatly helped in establishing a sequence of operations at the new shops while the old plant was still operating.

A machine tool in operation in Jersey City Monday morning could be dismantled and shipped to the new plant at New Haven and again to be in operation on Wednesday morning. This speed in dismantling, transporting 85 miles and again setting up a large machine was possible only through careful preparation. The position of the tool in the new plant had to be carefully determined. Castings or partially completed parts had to be on hand waiting for the tool. Power facilities had to be prearranged. If the tool in question was to be belt driven it was necessary to see that the proper shafting and pulleys were in place and ready to operate. If, as was the case with most of the tools, the drive was to be by individual electric motor, the proper cables and switches had to be mounted and ready.

A corner of the machine shop just after a battery of vertical turret lathes had been placed in operation, is shown in Fig. 4. Two of these are new machines and the others were moved from New Jersey. Each of the latter was moved and put in operation before the succeeding one was disturbed. The foreman in charge of this department worked at Jersey City until one Wednesday evening when he boarded a train for New Haven and the following morning took up his usual work at the new plant.

The expansion of the Safety Car Heating & Lighting Co. attracts interest to the manufactured product itself. The principal output of the company is a generator for use in railway cars. One of these is shown in position in Fig. 2. It is belt driven from a pulley mounted on one of the car axles and is supported from the steel frame of the car itself.

In the economic production of this generator machine tool practice has played an important role. Each part going into the completed unit has been studied with the idea of reducing the cost of production. A detailed description of the operation in connection with one of the parts may serve to indicate the general procedure in the construction of the whole. The pulley serves as a good example. Fig. 6 shows the rough castings in the left background and the completed pulleys in the foreground. In setting up the pulley on the vertical turret lathe it is gripped by especially made internal jaws provided with spurs or points which press into the metal of the casting and hold it firmly into place.

The first operation is made with a double tool on the turret attachment and consists of a single cut with about an inch travel requiring a minute and a half. The second operation is the rough boring done with a roughing reamer and requiring three and a half to four minutes. For the third operation the revolving center of the turret attachment is lowered into the bore of the pulley in order to give additional rigidity. The operation consists of a rough cut over the inner surfaces of the flanges and across the crown of the pulley. For this a forming tool is used as shown in Fig. 6 and the proper

FIG. 3—GENERAL VIEW OF MAIN MACHINE SHOP DURING EARLY STAGE OF MOVING

curve of the crown is obtained by a cam attachment at the side. This operation takes seven minutes. The fourth operation is a finishing cut over the same surface as that in the third operation and also requires seven minutes. The fifth operation is finishing the bottom of the flange and this takes one and one-half minutes. The sixth operation is finishing the bore and requires four minutes. This completes the work with the exception of finishing the under surface of the hub which is within the jaws of the internal chuck and therefore difficult to machine. Finishing this surface by ordinary practice would mean a second set up for the one operation alone which, in addition to loss of time might introduce inaccuracies. To avoid this, in the case of pulleys where the bore is sufficiently large to permit, a right angle cutting tool is introduced through the bore and by this means the under surface of the hub is finished with the pulley in place in the original setup.

From this brief survey of operations the total time required for machining a single pulley is seen to be 25 minutes exclusive of time employed in setting up the work and in changing from one operation to another. As the tools are all fixed in place either on the turret or the side attachment, the change from one operation to another requires very little time. In fact, the normal practice is for one man to complete the machine work on two of these pulleys, as described, in one hour. The machining of other parts going into the construction of the generator unit follows along lines similar to that of the pulley, with variations in accordance with the nature of the work and the greater complexity of design. Keyways in pulleys are broached and this operation in progress is shown in the center of Fig. 4. Two 42-inch vertical turret lathes in operation on a generator frame casting may be seen in Fig. 5. The advantage of the turret lathe is clearly shown in this operation for the casting itself is a difficult one to set up requiring from 20 minutes to one hour for that operation.

The evolution and design of the axle-driven car lighting units has been interesting. The first application of this method to the lighting of cars was in England where, because of the short cars and the fact that each complete car was virtually a truck in itself with comparatively little movement of the axle journals relative to the car, it was possible to mount the generator rigidly to the car frame and drive in the ordinary way with a belt from the axle. In introducing the individual car generator to American equipment the movement of the truck on curves was so great as to make it seem impossible to mount the generator on the car frame. The expedient in this case then was to have the generator supported from the truck frame. This held the axle of the generator parallel to the car axle at all times and seemed to be the problem's logical solution. The vibration of a car truck, however, as it travels over steel rails is greatly in excess of the vibration of the car body which has the added advantage of its weight and of springs. This difference in vibration proved to be a more serious handicap than the movement of the driving axle out of parallel

FIG. 4—ONE CORNER OF THE MACHINE SHOP. A BANK OF FIVE BULLARD VERTICAL TURRET LATHES IS SHOWN WITH A LAPOINTE BROACHING MACHINE IN THE FOREGROUND

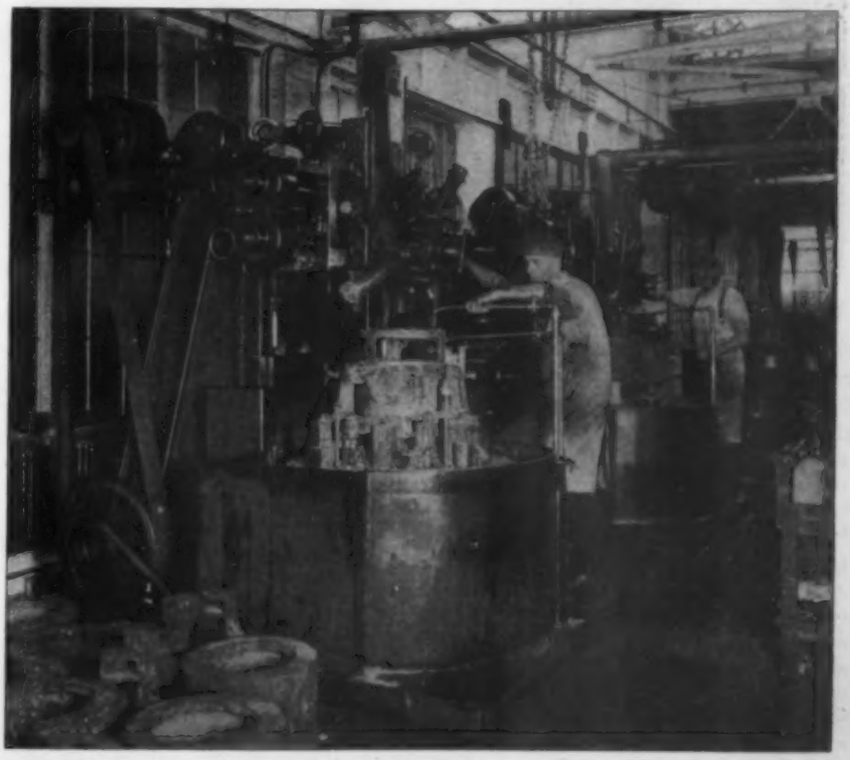


FIG. 5—FOR MACHINING THE GENERATOR FRAMES, TWO SET-UPS ARE REQUIRED. TWO MASSIVE TURRET LATHES ARE USED, ONE SET-UP BEING MADE ON EACH LATHE

with the generator axle, as is the case where a generator is mounted on the car frame, and therefore designers have been forced back to the original English scheme with, however, modifications to adapt it to American cars.

In addition to the problem of properly mounting a generator was that of allowing regulation. At first this was obtained by allowing the belt to slip when full load on the generator was reached. It is now, however, obtained by varying the field current in the generator. The disadvantage of having a driving axle turn out of parallel with the generator axle has been overcome by special design of crowns and flanges of both driving and driven pulleys and by supporting the generator frame itself so that it has some movement or play in the direction of the belt. Tension on the belt is maintained by springs so arranged that it is constant at all positions of the generator. The experimental stage in axle driven car lighting equipment has been passed. The many difficulties which originally presented themselves have been met and overcome and electric lights obtained from the axle of each individual car are now considered the most advisable means of lighting, even on second class rolling stock and branch lines.

It is this that explains the demand which has caused at least one plant to seek larger and better quarters at a time when many plants in other lines were retrenching. Already the New Haven plant is seen to be inadequate to the needs of the Safety Car Heating & Lighting Co., but unlike the site in New Jersey there is room at the new quarters for any expansion which may be necessary. One feature of the plant as it stands is a power house consisting of a separate building, 79 feet long by 60 feet wide with brick walls and steel frame and equipped with modern boilers and generating equipment. Fig. 1 shows a general view of the plant taken from the Dixwell avenue side. The work of moving from the New Jersey plant has now been completed and production on the new basis is rapidly reaching the capacity which was planned with the enlarged quarters and increased equipment.

The moving operation itself was entirely satisfactory both as to minimum interruption to production and as to actual cost of the transporting of equipment. A plant in going from one industrial district to another usually does not move a great distance so that a hundred miles would probably cover the majority of such changes. The advantage, however, of not having to rehandle equipment, of loading it when convenient, and of being able to figure with reasonable assurance on the time of transit, these, together with the elimination of much crating, is thought by the management of the New Haven plant to offset railroad transportation even between points a considerable distance apart.

The scope of truck transportation is gradually enlarging and the case of the New Haven plant is an actual instance where a large saving in production was effected.

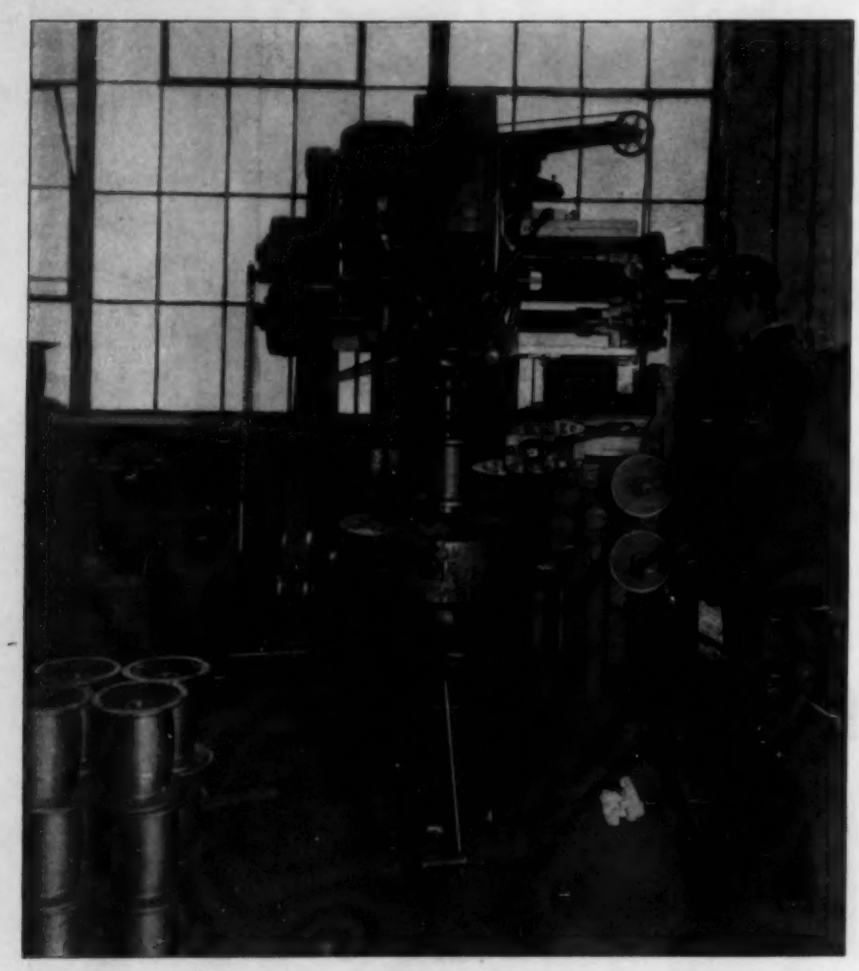


FIG. 6—ON SOME OF THE PULLEYS, COMPLETE MACHINING IS DONE WITH ONE SET-UP ON A VERTICAL TURRET LATHE

Book Review

Foundry Molding Machines and Pattern Equipment, by Edwin S. Carman, cloth; 6 x 9 inches; 225 pages, published by the Penton Publishing Co., Cleveland, and furnished by THE IRON TRADE REVIEW, for $5 net.

In this second edition many of the details and ramifications of the art of machine molding are covered more completely than they were in the first edition. The book will be appreciated by those in the foundry industry who are desirous of changing their methods from hand to machine molding. It also will be of assistance to the manufacturer who wishes to have the members of his organization furnished with a complete and authoritative treatise covering in detail the most approved methods pursued in pattern mounting and machine molding.

Chapter 1, treating of the fundamentals of machine molding both elementary and advanced theory and practice, has been added with a view to meeting the needs of educational institutions. It is given to aid the many colleges, institutes, technical and trade schools which desire to give the student a training in up-to-date foundry practice, but are unable to do so because of a lack of sufficient data with which to prepare a course of study.

Believing that pictures are a great aid in the presentation of ideas the author has employed them freely to illustrate the method of mounting patterns and the making of molds by machine power. The different types of molding machines, together with the flask and pattern equipment necessary for their use are explained in such a way that the reader will receive a group of fundamental conceptions in regard to machine molding that will be of value to him in any line of engineering work in the foundry.

PURCHASE ORDER

Order material listed below.

Quantity	Description	Price

Fig. 1

Order No. _____

Requisition No. _____

Wanted by date _____

Prices are F. O. B. _____ Date _____

Ship by _____ Ship by _____

When received notify _____ Contract _____

MATERIAL SLIP

This slip authorizes the purchase and use of the materials as follows, and is the only purchase order authorizing the use of materials other than the bill of material.

Drawing No. _____ For Contract No. _____

Fig. 2

Rejection Notice No. _____

Send to _____

_____

Production Engineer

Fig. 1—Simultaneous with the bill of material, the purchase order is made out and sent to the purchasing department. Fig. 2—By use of the material slip, rejected or omitted material is replaced

Engineering System Aids Production

BY M. H. POTTER

EFFICIENT systems in the engineering department serve a useful purpose by encouraging maximum production in the plant and the progressive works managers have not been slow to realize this fact. However, the chief draftsman and those in charge of the engineering department, in many instances, have been kept so busy in producing the required number of drawings that they have been inclined to let the system look after itself. In other words, the engineering department has not functioned properly from the production standpoint.

The practical usefulness of any system or definite method of procedure loses its real advantage unless it is so changed or rearranged to adapt itself to individual requirements. That is, it is only through careful analysis of existing conditions and requirements that any system or group of methods can be used with facility. From time to time, the alert executive may run across some simple or disconnected chart, plan or instruction that he can use just as it stands but this is not true of any system of grouped methods.

The bill of material shown in Fig. 3 should be made upon completion of the drawing or tracing. A separate piece of tracing cloth, or pieces, should be used if the work in hand is such that the divisions can be made to the best advantage by sub-assemblies or assemblies. If, however, the divisions are to be made by drawings, then the bill of material may be ruled off and filled in on the drawing itself. In this connection, care should be taken to separate such parts that may be standard, or parts which will be used from time to time.

Referring to Fig. 3 under the word "description" not only the name of the piece or article should be written but also an identifying description, for example, "shaft, 1½-inch diameter, 2 feet, 8 inches long, 2-inch standard right-hand thread 4 inches long, one end only." Under the heading "pattern number or mark" should be placed the symbol for the piece when no pattern is required, for instance, "shaft *S*" affixing 1, 2, 3, etc., when more than one shaft appears on the bill of material, likewise, "rod *R*, pin *P*," etc.

Such symbols assist the stock clerk and those concerned to recognize more readily the material listed. Under the heading "source" should be placed the department furnishing the material, or if purchased from without the plant, the purchase order number, Fig. 1, should appear. The columns to the extreme right should be inked in solid so as to appear in white

BILL OF MATERIAL

Line No.	Quantity Required	Description	Material	Pattern No. or Mark	Drawing No.	Source				
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

UNIVERSAL MFG. CO., Detroit, Mich.

Material bill for _____ Shipping date _____

Made by _____ Date _____ Checked _____ Dept.

S. O. No. _____ Page _____

Contract _____

Fig. 3

REJECTION NOTICE

Date _____ No. _____

The following material has been rejected for:

Defective _____ Office error _____

Shop error _____ Change in design _____

" " order _____

Pieces	Contract No.	Shop order	Estimated labor	Disposition

Fig. 4

FIG. 3—FILLED IN AT THE COMPLETION OF THE DRAWING, THE BILL OF MATERIAL GIVES AN IDENTIFYING DESCRIPTION OF PIECES REQUIRED. FIG. 4—BY THE REJECTION NOTICE, THE ENGINEERING DEPARTMENT IS ADVISED OF FAULTY DESIGN

on the blue print and are for notes or references as required for the production or cost departments.

Fig. 6 shows a form used for both the drawing title and for the drawing index. The cards are filed numerically, according to the drawing number at the lower left hand corner. The different sized drawings, A, B, C, D, etc., have the letters prefixed to the drawing numbers and are filed separately.

The purchase order request, Fig. 1, is filled in at the same time the bill of material is made out. All material not carried in stock is listed on the purchase order, which is immediately dispatched to the purchasing department. In many cases, due to the present market conditions, it has been found advisable to make out purchase orders, whenever possible, even prior to starting the drawings.

The pattern shop order, Fig. 5, needs little or no explanation but is an important part of aiding production and eliminates repetition of patterns, inasmuch as the engineering department has available knowledge to order correctly the necessary patterns from the pattern racks or to be made up. Fig. 4, the rejection notice, informs the engineering department of necessary replacements, and enables this department to keep in touch with faulty design and other irregularities.

The material slip, Fig. 2, controls the use of material needed to replace rejected material. It also enables the shop to secure material when it has been omitted from the bill of material. The proper control of material slips will prevent the allotting of unnecessary material and is an important requisite toward correct cost to manufacture. An order list, Fig. 7, is used for reference purpose in the drafting room, all orders for each contract being placed on a separate sheet.

There is little question but that many engineering departments could increase their usefulness by adopting a system as just outlined or one of a similar nature. Inasmuch as delays would be avoided, waste and variance from the drawings could also be eliminated. Naturally the class of work produced would necessitate minor changes in the system, but the general principles and divisions should be observed. Likewise this is true of the forms used, minor changes would have to be made to suit the existing conditions.

Will Improve Plant

Following the awarding of a contract for the provision of a new hearth jacket, hearth cooling plates and stove fittings for its furnace, the Emporium Iron Co., Emporium, Pa., has decided to make additional extensive improvements to its entire plant. A new single track skip bridge, hoist engine and skip cars will be provided to replace the present hand-filling arrangement. The present furnace top structure will be dismantled and a new top platform will be installed, including a revolving distributor and a bell-operating equipment.

New suspension type ore bins, a new coke bin and trestle as well as a scale car of 80 cubic feet capacity with necessary track and skip pit constitute part of the reconstruction. A single strand pig casting machine will be installed, the hot metal being delivered from the furnace by means of a 50-ton type ladle. Other minor improvements will be included. Arthur G. McKee & Co., Cleveland, has been awarded the contract and will handle the entire designing and erection of the improvements.

Magnesite Output Good

The magnesite industry as a whole enjoyed a good year in 1920, according to the United States geological survey. The quantity mined exceeded that mined in any year previous except 1917, it is stated. Notwithstanding the contention of domestic producers that they could not survive without tariff protection, they have come through 1919 and 1920, the survey points out. Preliminary figures place the 1920 output of magnesite in Washington as 235,000 net tons, against 106,200 tons in 1919. Practically all of this was reburned and sold as refractory material to steel companies, says the survey. The crude magnesite output for California in 1920 is placed at 60,000, thus making the total for the United States last year between 275,000 and 300,000 tons. Imports in 1920 are estimated at 50,000 tons of crude magnesite, or about double the importations made during 1919.

A brief report just issued by the United States geological survey describes the manganese deposits of the Batesville district, in north-central Arkansas, which have been workd intermittently since 1849 and have yielded both high grade and low grade ore for metallurgic use. The output of high grade ore in this district from 1849 to 1918, inclusive, was 75,985 tons, and that of low grade ore was 69,237 tons. Mining in the district was especially active during the period of the world war.

PATTERN SHOP ORDER

Make Following Patterns: Cont. _____

Drawing Nos. _____

No. Required	Pattern No.	Description	Completed

Castings to be ordered.

Patterns completed.

Castings ordered.

Castings received

Signed _____

Fig. 5

ORDER LIST

Contract No.	Material	Order No.	Order Date	Promised	Purchaser

Fig. 7

UNIVERSAL MFG. CO.

Title _____

Sub Title _____

Drawn _____ Traced _____

Checked _____ Approved _____

Date _____ Scale _____

Contract _____

Dept. _____

Drawing No. _____

Fig. 6

FIG. 5—DUPLICATION OF PATTERNS IS ELIMINATED BY THE PATTERN SHOP ORDER MADE OUT BY THE ENGINEERING DEPARTMENT. FIG. 6—THIS FORM PLACED IN AN INDEX IS A RECORD OF EACH DRAWING AND ITS FILING LOCATION. FIG. 7—THE ORDER LIST USED FOR REFERENCE PURPOSES SHOWS ALL ORDERS FOR EACH CONTRACT

Standardizing Motors for Tools

Machine Tool Makers Will Find It Easily Possible To Apply General Types of Electric Motors to Same General Machines—Motor Manufacturers Should Co-operate with Machinery Designers

BY H. R. WEEDON

STANDARDIZATION of electrical equipment cannot mean duplicate motors, control, generating apparatus, etc., type of drive, style of control and ratings. A great deal of benefit can be derived by putting the same general types of electrical apparatus on the same general types of machine tools. Many types of motors and control, open, semi-enclosed and enclosed and with various degrees of protection for the motor and tool are available.

For example we have: First, a constant speed motor which can be used for saws, screw machines, lathes, and general service; second, an adjustable speed motor which can be used for planers, milling machines, drills, lathes, etc.; third, constant horsepower which can be used on the general line of machine tools; fourth, varying horsepower which would be applied to fans, pumps and similar apparatus; fifth, motors with high starting torque which should be used for punches, shears, elevators, or any machine where a heavy fly wheel is used; sixth, motors with low starting torque which can be used on drills, lathes, shapers or any machine where light starting duty is satisfactory; seventh, motors with high pull-out torque more particularly adapted to grinders; and eighth, high frequency motors which so far have been applied to woodworking machines where very high cutter speeds are desired. Possibly also grinder applications will be worked out along this line.

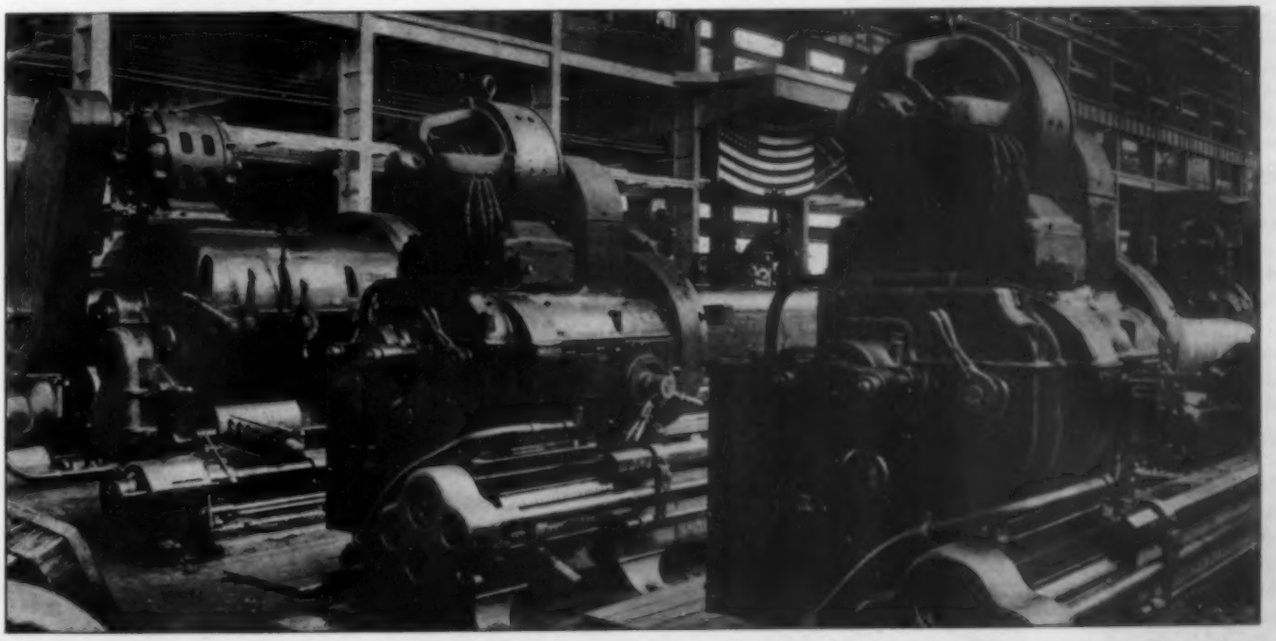
Moreover, "motor drive" conveys different ideas to different people. For example, on the same line of tools some manufacturers will apply a high torque motor, others a low torque motor, some constant speed, and others adjustable speed. Some equip their machines completely, including a line switch, while other manufacturers have even omitted starters where starters are necessary. A motor-driven tool may mean to one manufacturer a motor belted to the tool from floor or ceiling, while to others it means a motor actually built into the machine.

With this great diversity of ideas as to motor-driven tools, confusion and dissatisfaction occur. A solution of the problem is found when the machine tool manufacturer takes the electrical manufacturer's engineer into his confidence at the time of design. In addition money often will be saved and worry eliminated. Frequently a tool with a better appearance and one which will operate more satisfactorily will result. Many times the machine tool builder will call in an electrical engineer after the tool is built and ask for his assistance in applying a motor. This often makes it difficult to work out a good application. When the electrical drive is considered more as a mechanical item, that is, a necessary part of the tool, instead of as an afterthought, the results will be surprising.

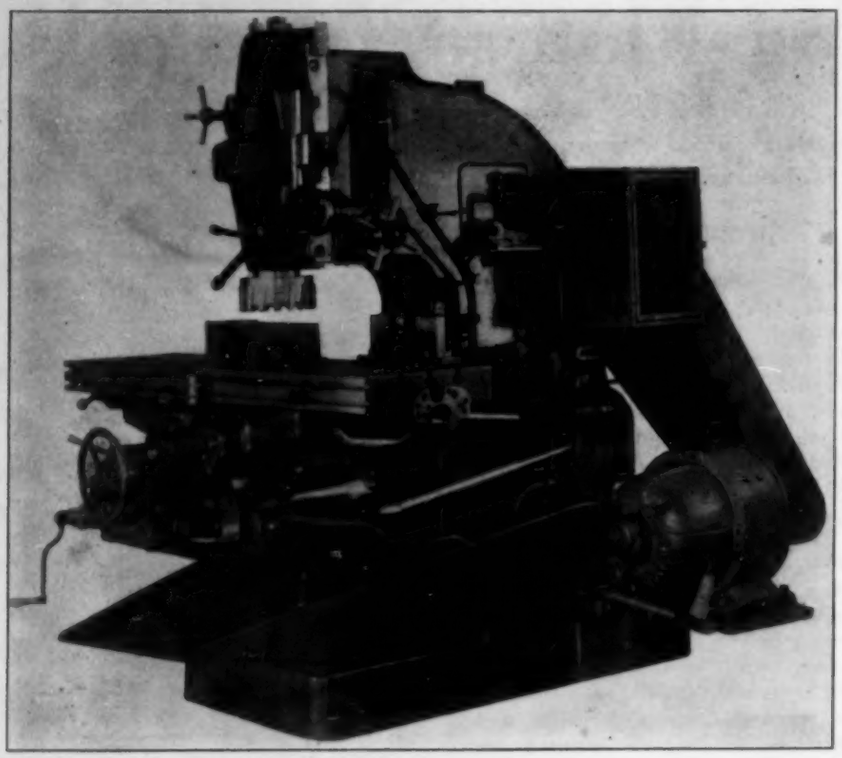
After a tool has been completed, it usually is necessary to make a special bracket to support the motor and sometimes a request is made for a special motor. Both plans are unsatisfactory since an earlier attention to this point would provide a suitable mounting without difficulty. Some manufacturers provide a space in the bed of the machine which entirely protects the electric drive and saves floor space. Others find that a motor built into the machine works out nicely, being economical of materials and space, beside saving gears or other driving medium.

Some manufacturers purchase only the stationary and rotating parts of motors and build the mechanical parts

From a paper presented before the National Machine Tool Builders' association at the Hotel Astor, New York, Nov. 11-12. The author, H. R. Weedon, is in the Boston office of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.



DEPENDING UPON LOCAL CONDITIONS EITHER ALTERNATING OR DIRECT-CURRENT MOTOR DRIVE CAN BE USED IN OPERATING THESE LARGE LATHES



DESIGNERS HAVE PERFECTED THIS MILLING MACHINE WITH AN AUTOMATIC CONTROL AND ALSO HAVE SPLASH PROOFED THE MOTOR

in their own shops. This is indeed treating the motor in a most mechanical way. This method reduces bearings, and expensive speed boxes, levers, and other machine parts. It makes a simple and compact drive and increases the efficiency of the tool without decreasing the efficiency of the motor.

Horsepower Application Important

Another important item is the application of a motor of proper horsepower and speed to the tool. Only by actual tests can this be accomplished and the electrical engineer easily and quickly can determine the exact horsepower to be applied. Often a large size tool is purchased to machine bulky parts with light cuts. A closer study of work to be performed will result in greater satisfaction to everybody concerned. Of course in connection with the proper horsepower, the range of speeds of motors should be taken into consideration. It also should be borne in mind that a variable speed motor might be either alternating current or direct current, but an adjustable speed motor is direct current only. By "adjustable" a motor, whose speed setting can be definitely determined and maintained regardless of load being carried is meant. Then, too, many operators will fail to shift gears to a higher speed if that particular geared step is large, fearing tool damage, while with an adjustable speed motor giving many small speed graduations, he often will reach and pass the speed point he feared.

Proper cutting speeds of the tool mean, of course, greater output and decreased expense. Without multiplying examples, an actual test on two machines, on exactly the same work showed a power saving of 40 per cent with direct connected motors. A planer by actual test showed an increased production during a period of 30 days, of 30 per cent over a similarly operated belted machine. In another case a company having changed a tool from belt drive to motor drive, showed an actual profit in one year of $420 due to increased output.

Of course, in the installation of motor-driven tools there is a decided saving because of the omission of countershafts with bearings, necessary millwright work, etc. In reversing service, such as planer or other shock service, the direct connected motor absorbs this stress with its inherent cushioning effect, instead of throwing the strain on hangers, shafts, and belts. Also belts slip more often with heavy loads, which is just the time the most power is needed. The direct drive eliminates these belts, gives better location of machines for production schedules, saves expense of belts and belt guards, avoids the loss due to friction, likewise the decreased output due to the increased slippage of belts. This is a decided advantage. With some tools, it is practically imperative that belt drive be used. Many times this can be arranged by placing the motor on an extension of machine bedplate or even mounting it on the floor. This will not interfere with crane operation and interferes with the lighting effect but little. In a certain shop the lighting bill was cut 40 per cent where overhead shafting and belts were eliminated.

Should Take Several Motors

When designing a tool for using a standard motor, the mounting should be of a type that will accommodate more than one make of motor. If at all possible, the design should take either alternating or direct current motors of at least two makes. With either alternating or direct current motors, two types of control can be used, namely automatic and manual. Especially with automatic, the control can be placed at a remote location with the pilot switch within easy access of the operator's hand. With manual control or starter, it should be placed as near the operator's position as possible, without interfering with proper manipulation of the tool. Especially on lathes, a master drum control can be operated from apron by means of a spline shaft. A study of utility of control, giving start, stop, reverse and speed control, will often reveal a saving on tool construction as well as simpler design.

Many manufacturers have spent a great deal of time and money to accomplish mechanically that which can be accomplished more cheaply and simply electrically. For example, clutches, gears, expensive speed reductions, etc., can at times be eliminated as almost instant start or stop, smooth acceleration and slow down, fine speed adjustment and some other advantages are available at low cost. As an example of an advantageous application take a driving wheel lathe where with a push button station a 50-horsepower motor is started, stopped, brought to full speed, and if a hard spot is found in the wheel, the proper button will slow the motor to half speed and when the hard spot is passed, bring the motor to full speed within one second.

By equipping the control with a proper overload relay, expensive friction clutches which often otherwise would be necessary to protect the machine tool from extraordinary strains become unnecessary. A recent problem was so to protect a motor that with a given tool, the pounds pressure could definitely limit the strain on that press to a predetermined value.

In speaking of the overload relay, this is a great time saver for the operator. Much money can be spent for different types of tools, better steel and investigations to save an operator's time and the entire saving wiped out by the mere blowing of a fuse, necessitating an extended search for the plant electrician. Proper overload relays could be instantly reset.

The importance of having the starter for the motor equipped with what is termed "low voltage protection" is recognized. This means that if for any cause, the line circuit fails, the motor will not automatically restart when the current returns. Without this the operator, forgetting to open the line, might be changing a tool, or gaging his work and serious results would follow the unexepected starting of the motor.

In selecting the starting equipment careful consideration should be given to the advisability of using automatic control, with the push button conveniently placed. It has been thought by many that automatic control is expensive, but such is not the case. In many instances, it is possible to furnish an automatic starter with low voltage and overload protection at a price equaling similar protection with a hand starter. In those cases where the cost is greater, the difference usually is justifiable.

It is true that where a complete plant is driven by individual motors, a somewhat higher first cost is noted. A little more power apparatus would be installed and the power bill might be somewhat larger. As a matter of fact, however, it has often been found to net lower. Many have found that, while the labor cost is about 50 per cent or more of the total cost of production, the power cost would be 3 per cent or less.

Tests Show Lower Cost

Even if the power cost is increased 1 or 2 per cent and thereby the labor cost is decreased 10 or 15 per cent, it is well worth while. All tests show decreased maintenance cost for individual drive and proper arrangement of machine tool equipment for production is the prime factor anyway.

Plant engineers know that for certain groups of machinery, it often works out well to have one motor drive several tools. The machine tool manufacturer, however, wants the best possible result from his own machine and this usually with more or less disregard within reason, to the first cost of the tool. Several cases have been noted where a machine tool manufacturer made certain statements regarding production which he could not meet with group drive. A customer is given a certain production schedule which the tool will fail to meet if his drive conditions are faulty. The service engineer could determine that the fault is really in the drive conditions, but this involves criticism of the customer's plant organization and might be a disagreeable task in many instances.

Careful Study Is Required

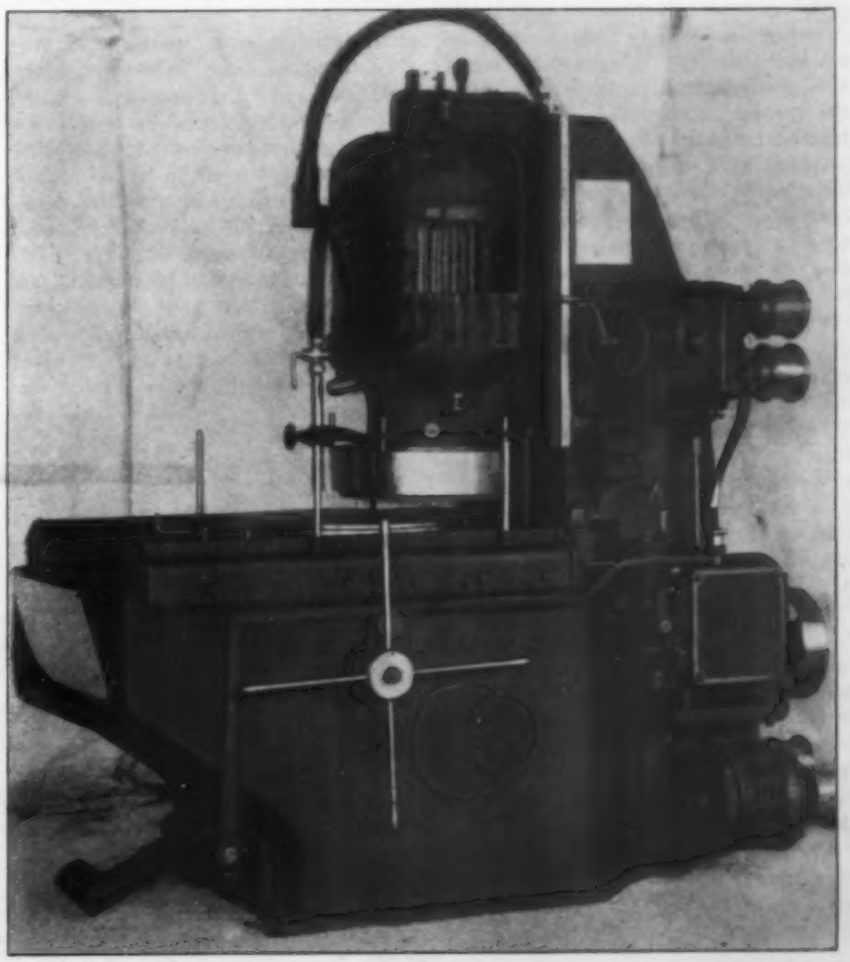
In the past five years there has been a steady increase in the power absorbed by machine tools, and an actual test of the ability of your machine to absorb power is the safest and most convenient method for you.

In order, therefore, to make a "real" application, and this means to get all tool builders applying the same types of electrical equipment to the same general line of tools, a careful study is required of the nature of the service, such as continuous or intermittent rating, variable, light or heavy load factor, which brings into consideration the temperature rating allowable, and the proper application regarding high and low torques and speeds. For these various combinations there are motors and control available.

It is desirable for the motor manufacturer to co-operate on the design of tools at the time they are designed and to work out with the machine tool builders' engineers just what motor and control to apply, so that the maximum possible results will be obtained from a given machine.

In the last analysis, the machinery manufacturers are the ones who win by supplying a properly driven tool. Their aim is to furnish a machine which will satisfy their customers with that machine as a whole, and the electrical engineer can assist them to this end.

The Electric Furance association, Niagara Falls, N. Y., has just published an 80-page booklet containing the papers and discussions presented at the Columbus, O., meeting of the association last October. The pamphlet is entitled "Refractories for Electric Furances".



AS TYPICAL OF CAREFUL THOUGHT IN MACHINE DESIGN, THE MOTOR HAS BEEN BUILT AS AN INTEGRAL PART OF THIS VERTICAL GRINDER

When Contracts May Be Canceled

Mere Fact that Performance Is Difficult Is No Excuse in Eyes of the Law—Oral Agreements Decidedly Difficult To Enforce—A Professional's View on Legal Phases of "Cancellitis"

BY CHESLA C. SHERLOCK

THE widespread cancellation of business contracts during the past six months has raised many questions of interest, not only as to the probable effect of such action on the business welfare of the nation, but as to the legal significance of the acts involved.

The current joke about the retailer who wired to a jobber: "Please cancel my contract immediately," and the jobber's reply: "Unable to do so. You'll have to wait your turn," has a serious aspect. It calls up some legal questions which are important to the average business man, whether he sells tractors, groceries or wire staples.

Business men, as a rule, are fairly well versed in what is necessary to make a valid and binding contract in the first instance. They understand all about the law in regard to having the agreement in writing and under the proper formalities. They have learned, perhaps through bitter experience, that it pays to express the intention of the parties clearly and concisely. When they are asked to sign a contract, they read it all through with critical eyes, looking for the "joker" which may lurk in it.

Being conversant with the how and why of getting the thing done right, they generally are content to let the matter rest. Most business men give as much thought as to how a contract may be legally canceled or rescinded as the average married man does to the grounds of divorce. It seldom enters their heads until they consult their lawyers, and then many find they have no redress.

It may seem to many business men that the law is a harsh and jealous mistress; that her benefits and favors are all on one side of the slate. In reality, the law is not one-sided concerning the matter of contracts, if we but keep in mind just what the contractual relation contemplates and the ends it seeks to secure.

The first thought that the law has in regard to contracts is that they are to be carried out, once legally consummated. The object merely is to see that men live up to their promises If everyone did that there would be slight need for the law of contracts at all. Contracts, if they are to be upheld and sanctioned by the strong arm of the law, must be made according to the forms of the law as prescribed by the proper authority.

Relying on Oral Contracts

Thousands of contracts are made and executed each year in which the law has no part and which could not be enforced in a court of law. This is simply because the parties in the goodness of their character or through ignorance carry them out. Business is being done more and more as time goes on in a way not at all contemplated by the law. Thousands of transactions occur every day over the telephone, for instance, which could not well be proved in court. Oral agreements may be ample for the parties, but they are decidedly uncertain when brought into court.

The law does not, however, subscribe to the old doctrine of *caveat emptor* quite so much as is popularly supposed It seeks substantial justice between the parties and contemplates no other thing. The law recognizes that there are instances where substantial justice cannot be had between the parties if the contract must be enforced. And it lays down the manner in which contracts may be avoided, all of which are predicated on the thought that the contract, other things being equal, must be carried out if within the realms of possibility.

To place a premium on anything else than the execution of the contract would be to render the law a mere travesty on justice. You cannot escape from the inevitable conclusion that in the vast majority of cases substantial justice is to be obtained only through the performance of the agreement as originally formulated by the parties.

Considerations enter in which render performance impossible or undesirable even in the contemplation of the law. Perhaps there has been fraud or a concealment of some material fact on the part of one of the parties to the agreement; perhaps, there has been a failure of consideration or a failure of the warranty as made by the seller. Performance as contemplated by the contract may be impossible, or one party may discover that the contract does not express the true agreement reached by the parties and he may seek to have it interpreted by a court of equity so as to defeat the claims of the other party. Or the contract may not be binding on the one party because the other party has failed to perform his portion of it.

Suppose, for instance, that a contract is made between parties calling for goods of certain specifications. When the goods arrive it is found that they do not fill the specifications in the contract. The buyer has a right to rescind the contract for nonperformance and is not liable for any action on the part of the seller.

An offer may be canceled any time before it is accepted by the other party. There is a presumption that the offerer grants the other party a reasonable time in which to accept or decline, and the cancellation must take place before the party makes up his mind or gives affirmative evidence of his intention to accept. The offer cannot be canceled after it has been accepted.

A mutual mistake of fact between the parties will void the contract. The contract is nothing but a meeting of the minds of the parties as to some object, and where there is a mutual mistake of fact as to some material point in the agreement, there is no such meeting of the minds as will constitute a valid agreement between them.

A contract, for instance, about one kind of machinery is not consummated when the minds of the parties are, in fact, contemplating another kind. A contract concerning a certain kind of raw material is not binding when the written instrument is about finished products. If a man owns two factory sites and undertakes to sell one of them, misunderstanding the particular site which the buyer wants

(*Concluded on Page* 563)

The author was formerly secretary of the Iowa Industrial commission.

Foundry Is Electrically Operated

Current Is Utilized for Melting the Furnace Charges, Annealing the Castings and for Baking the Molds and Cores—Annealing Operation Is Intermittent—How Light Steel Castings Are Made

BY H. E. DILLER

IN THIS country of great manufacturing achievements, the motive which prevails in every line of industry is to produce on a vast scale and to organize for large accomplishment. The railroads constantly are striving to increase the train-load capacity for freight, and building heavier locomotives and cars with a larger carrying capacity. Steel mills endeavor to break each new record for tonnage rolled in a given time. Repetition methods bring higher production in foundries. While this tends to divert attention from accuracy and leads some to slight the fine points in manufacturing, industries such as the watchmaking and precision instrument enterprises, which demand extreme accuracy at all times, are successful in accomplishing fine adjustments. However, even these industries are carefully organized to manufacture on a large scale and are fittted with automatic machinery wherever possible there is no temptation for them to drift into lines requiring less painstaking methods and giving more volume of production because there are no such openings in their branch of manufacture. However, the steel foundryman who starts with a purpose to solicit only that class of trade which demands castings that require minute care in their production constantly is confronted by the appeal to take work which can be turned out rapidly and with comparatively little care. Such work gives a larger output and makes a greater showing. Then, too, when the demand for the finer castings is slack, the temptation is strong to fill the shop with any work which may be had. The coarser work must be turned out at a lower price per pound and so cannot be given the detailed consideration which the molder is in the habit of devoting to the regular class of work in the shop. After a molder has worked for a while on the heavier castings, it is difficult for him to come back and give the care necessary to the production of finer castings. These considerations already have caused many companies which have started with the intention of specializing on delicate castings gradually to drift from their original intentions and fill its shop with quantity work. One of the latest companies to start with the avowed purpose of specializing on the production of small intricate castings is the Emery Steel Castings Co., Baltimore. From the following description of the equipment which this company has installed, it may be seen that its nature will have a tendency to hold the company to its original intentions.

Electrical Heat Is Used

The characteristic of this equipment is that electrical heat is used in all cases. Beginning with the electrical melting furnace, the metal is cast in molds dried in an electrical oven and annealed in an electrical annealer. Heavier castings which could be made from a steel inferior to electric furnace steel, and not requiring annealing nor died-sand molds would render these electrical furnaces and ovens superfluous. Before deciding on the type of furnace to be adopted. I. C. Emery president and engineer of the company, made a study of the possibilities of the electric furnace for melting, annealing and baking. Data were available to show what could be expected from the melting furnace. Less definite information could be secured in regard to what results might be obtained from the electrical annealing furnaces, but the pit furnaces used during the war for heat treating gun forgings served as a basis for computing the power necessary for operating these furnaces. However, little accurate data were available to determine the best design and operating conditions for the mold-drying oven, nor could the amount of cores dried by a kilowatt hour of power be determined accurately. Three different sources where information on this point was available disagreed materially and Mr. Emery had to estimate the power to be required from what figures were furnished him from these disagreeing sources. The Electric Furnace Construction Co., Philadelphia, which built the core oven and annealing furnace, guaranteed the oven to bake 13 pounds of cores per kilowatt hour. It has been found in actual practice that even with intermittent operation, 18 pounds of light cores are baked per kilowatt hour. Larger cores require more power for baking, and as the plant is new, an absolute standard of power consumption has not been determined.

It was decided to start on a small scale and work out the organization necessary to produce the high grade line of castings which it is intended to produce. A 1-ton electric melting furnace was installed. The Electric Furnace Construction Co., working with Mr. Emery, designed and installed the annealing furnace and the core oven. With all this electrical equipment, it is essential that current be obtained at all times. Therefore, to avoid shutdowns owing to the power being off, two lines were run to the foundry from two distinct feeders which are in no way related to each other. Thus if one line is out of order, it is extremely unlikely that the other will be out of operation at the same time.

FIG. 1—STEEL IS MELTED IN A 1-TON ELECTRIC FURNACE

The melting furnace, shown in Fig. 1, has a rated capacity of 1 ton as already has been noted. The control board for regulating the arc was made by the General Electric Co., and the meter panel was secured from the

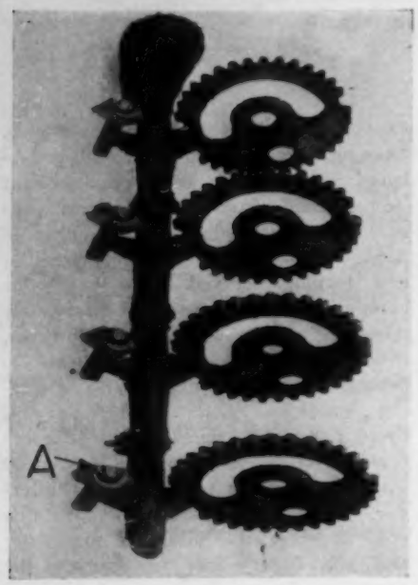


FIG. 2—A CORE $\frac{3}{8}$-INCH THICK IS USED TO FORM A CURVED HOLE IN THE CASTING AT THE LEFT

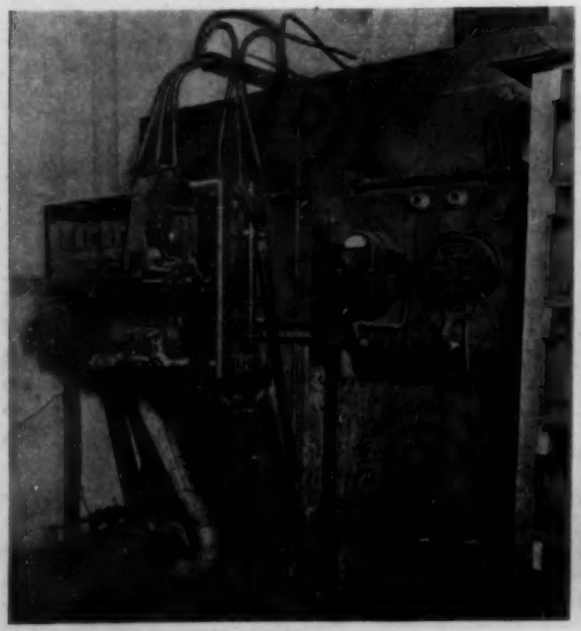
Westinghouse Electric & Mfg. Co. Fig. 1 shows the furnace on a Monday morning when the bottom has been repaired and made ready for the days run. A spare roof is kept in a pit near the furnace, covered with a wood platform. Thus, after the bottom is repaired in the morning, the heats can be run with a little patching between melts. Eight-inch carbon electrodes are used at present. The management saw little choice between the carbon and the graphite electrode. Both have advantages and disadvantages. While the electrical conductivity of the graphite electrodes is higher and a smaller electrode will serve when graphite is used, the cost of the graphite electrode is greater per pound and the heat conductivity is also higher. Figures secured did not show a marked advantage of cost in either of the two types of electrodes. An operating advantage claimed for the carbon electrode is that, being larger than the graphite electrode, it has an umbrella-like effect to protect the roof from the heat of the arc.

So far only two heats are taken off each day. Each heat requires about two hours. Succeeding heats would be melted in less time and if the furnace was operated continuously a heat could be taken out in little more than an hour and with considerably less electrical power. When greater production is required and several heats are made each day, the efficiency of the furnace will be increased considerably. Both plain carbon steels and alloy steels, including a 13 per cent chromium steel, have been made. Metal is shanked directly from the furnace for pouring into the molds which are arranged on the floor immediately around the furnace.

All the molds are dried. It is the opinion of the management that small molds should be dried, whereas a mold for a casting weighing 100 pounds or more would be made in green sand. However, it is not the intention to make castings as heavy as this. A local silica sand has been found which has a fine uniform grain and when mixed with a small proportion of clay and molasses water together with sea-coal facing forms a satisfactory mold. Great care is taken in preparing the facing sand mixture.

The molding and coremaking machines to be finally used have not been determined. A few counter-balanced, corebox-drawing machines and a jar-ram machine made by the E. J. Woodison Co., Detroit, have been installed, as well as two turnover, draw machines built by the International Molding Machine Co., Chicago. More molding machines will be installed to meet the varying requirements as the orders increase. The pattern equipment, of course, will be determined by whether the orders are for repetition work or for short orders, more expensive equipment being warranted by the former. So far, the volume of work has been mostly on small orders, but these orders have come from many parts of the country. Even one English firm which has a branch in this country found the Emery company could make a casting which it was unable to procure in England and has ordered a number of these castings for its English plant.

The main points to be observed in producing these intricate castings are to have the proper molding sand mixture; to take great pains to make each mold exact, and to pour the metal at the correct temperature when free from gas and slag inclusions. Some of the castings which are shown in Fig. 2, indicate intricate design of the work. As may be noted, these castings are made in a multiple mold; two castings in a section and four sections to the mold. The size of the sprue indicates



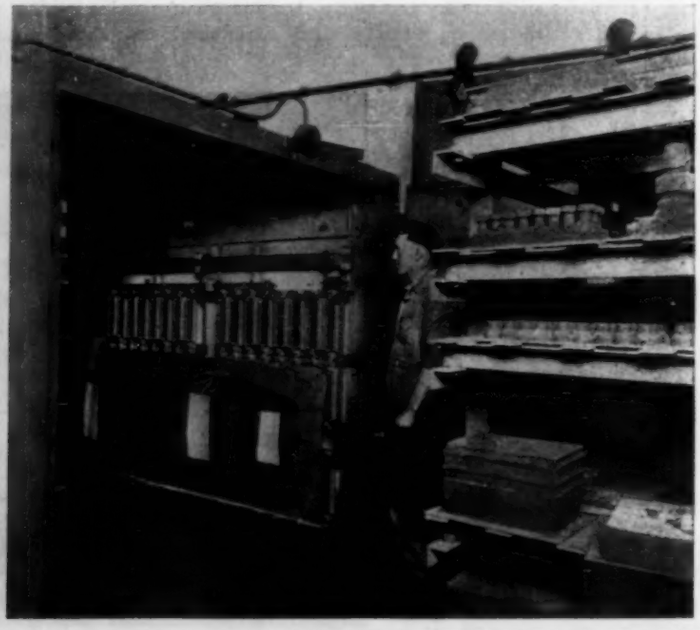


FIG. 3—ELECTRICAL CIRCUIT BREAKERS WITH A TEMPERATURE CONTROL PYROMETER AUTOMATICALLY REGULATE THE TEMPERATURE OF THE CORE OVEN FIG. 4—HEAT IS GIVEN OFF BY RESISTORS ON THE SIDES OF THE OVEN

that less than half the metal goes into the casting. The gear at the right is 5 inches in diameter and 3/16-inch thick. The casting at the left, which weighs about an ounce, is one of the most difficult the company has made. This is a plater for a knitting machine and requires a curved core, 3/32-inch thick at the point *A*. The core extends entirely through the head of the casting and is strengthened by two pins running perpendicularly to the curve. A slight excess of metal is added to the sides of the head and later is ground off. Even though this is an extremely expensive casting to make, when the price per pound is considered, the amount saved in not having to machine the hole cored out in the casting makes it cheaper than a drop forging would be. The mold, shown in Fig. 5, is 7 x 10 inches. The two indentations shown at the corners serve to locate the position of the section placed on top of it.

Electrically Heated Oven

As may be surmised, all the molds are quite small and comparatively easy to dry. However, it is highly important that they be dried uniformly and that the cores, or molds in one part of the oven are not baked harder than those in another section. This was one of the reasons which induced the Emery company to install an electrical drying oven. Another reason was oil could not be secured satisfactorily when the foundry was started and it is estimated that the cost of operation with either gas or oil would be as expensive as with electricity. On a small oven the expense of an attendant to watch the burner and temperature when firing with either gas or oil is high compared to the amount of molds dried; whereas, with the electric heating no attention is necessary after the car has been put in the oven and the doors closed. Coal or coke probably would be cheaper but it was questioned whether the temperature throughout the oven could be kept as constant or as uniform when using either of these fuels.

The inside of the oven is shown in Fig. 4, which indicates the type of resistors used. These resistors consist of resistance ribbon wound on insulators and divided into three circuits. One circuit consists of the two rows of coils at the top on the side of the oven. Another similar circuit is on the opposite side and the third circuit is composed of the lower coil on the two sides of the oven. The walls, roof and door are well insulated to prevent loss of heat. The rack of molds and cores is placed in the oven on a special spring-suspension truck,

FIG. 5—MOLD FOR THE CASTINGS SHOWN IN FIG. 2—GREAT CARE IS REQUIRED IN SETTING THE CORE

the bed of which is lifted mechanically.

When the door is closed and the temperature control thermometer is set, no more attention is required until it is time to remove the molds. The length of time required is being determined by experience and the oven will not be operated on the most economical basis until the correct time to allow the molds to bake is determined.

Fig. 3 shows the control and electrical equipment. At the right may be seen a temperature control instrument made by the Taylor Instrument Companies, Rochester. This instrument is attached to a thermocouple in the oven. The temperature is regulated by setting two pointers by a temperature scale on the upper face of the instrument. These pointers may be set as close together as desired, but the closer they are set the more frequently will they throw off and on the current, because when the temperature rises to the figure indicated by the pointer at the higher point on the scale, the circuit breakers will be thrown and the circuit will remain broken until the temperature of the oven falls to the point indicated by the lower pointer when connection again will be made. The Emery company sets the pointers at 450 and 470. Then when the temperature of the oven reaches 470 degrees Fahr. the circuit is broken and not connected until it falls to 450 degrees. Were the pointers set only 10 degrees apart, the circuit would be connected as soon as the temperature of the oven fell 10 degrees.

Lamp Signals Power Failure

On the instrument boards shown in Fig. 3, the kilowattmeter may be seen at the left of the temperature control meter. The circuit breakers are on the extreme left of the other panel. Below the circuit breakers may be seen a lamp. This lamp burns as long as there is power at the panel. Should the power go off at any time, the lamp will indicate this fact to the foreman. Without a free circulation of air, the moisture from the cores would remain in the oven and, with a damp atmosphere, it would be difficult to dry the molds thoroughly. A fan, direct connected to a small electric motor, is provided to overcome this as shown at the bottom of Fig. 3. The efficiency of the oven depends to some extent on the operation of this fan.

FIG. 6—THE DRIED MOLDS ARE SPREAD OUT ON THE FLOOR NEAR THE MELTING FURNACE FROM WHICH METAL FOR POURING THEM IS SHANKED

If too much air is passed through the oven, the cooling effect is excessive; while if not enough air is circulated the cores will dry slowly. Another device for assisting the circulation of the air in the oven is the sheet-steel plate placed at the lower portion

FIG. 7—A RECORDING PYROMETER REGULATES THE TEMPERATURE OF THE ANNEALING FURNACE—THE CAGE IN THE CENTER IS USED TO HOLD THE CASTING AND IS COVERED BY THE CASE AT THE LEFT TO PREVENT OXIDATION

of the resistors, as shown in Fig. 4. This forms a draft and also protects the molds from the direct radiation of heat from the resistors.

Molds are brought from the drying oven to one corner of the foundry near the melting furnace and placed on boards for pouring. This is not an arduous task and two men spread out the entire heat in half an hour. The foundry clerk marks the pattern numbers of the castings in each on the mold so that he may know what is contained if it is not poured. After the heat is poured, the molds are dumped into the trough shown behind the clerk in Fig. 6. From here the sand is wheeled into the sand mixing room inside the door shown. Two mixers of the muller type are used. One mixes the facing sand and the other mixes the backing sand.

Castings are annealed in a new pit-type electric annealing oven designed and patented by Dr. F. W. Brooks, of the Electric Furnace Construction Co., the builder of the oven. This style of oven was selected because it is desired to secure the annealed casting as free from surface oxidation as possible and to conserve floor space. The oven consists of a pit 40 inches in diameter inside the lining of firebrick, and 5 feet deep. The heating units are resistance ribbon wound on insulators similar to those shown in the insert, Fig. 8, and were secured from the General Electric Co. This pit is closed by a brick-lined cover as illustrated to the right in the same illustration. The cover is secured by a hinge at the rear and is raised by an air hoist attached to the eye shown at the front. Heat is controlled automatically by an arrangement similar to that described for the drying oven. However, a different instrument is used for throwing the current on and off. This instrument, shown at the bottom of the panel in Fig. 7, also records the temperature on a chart which may be seen extending down from the bottom.

The instrument is built on the potentiometer system in which no current flows from the thermocouples located in the annealer, but the temperature at the two points is indicated by measuring the difference in potential at the ends of the two wires from each thermocouple. This system eliminates a possibility of trouble from a change of resistance in the circuit. Having two couples, the one near the top and the other near the bottom of the annealer the temperature of the oven at these two points is recorded. The desired temperature is indicated on the back of the panel in the instrument in a manner similar to the way it is regulated for the drying oven. At present the temperature is automatically maintained between 1620 and 1650 degrees Fahr. The contactors and circuit breakers may be seen on the panel above the recording instrument. The kilowatt meter is shown at the left on a separate panel. A record is kept of the time in and out, the power consumed and the anneal number, as well as of the weight of the charge.

The annealing oven has a rated capacity of half a ton but holds from 1100 to 1200 pounds of castings in a heat, so the furnace is not run continuously. In this way the furnace is comparatively cool when the charge is put in and four hours are required for the anneal. After the correct length of time has expired, the cover beside the workman in Fig. 8 is let down in the pit over the cage containing the castings, one of which is shown at the center, Fig. 7. Slots in the top of the

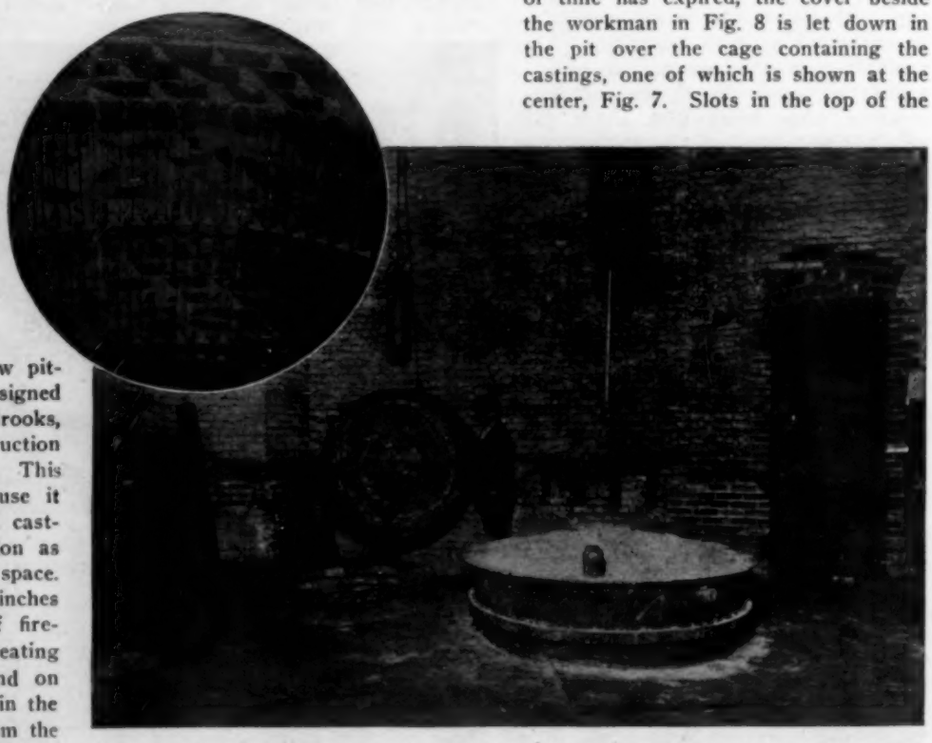


FIG. 8—TWO PITS ARE EMPLOYED FOR ANNEALING—THE ONE IS HEATED ELECTRICALLY BY RESISTORS SHOWN IN THE INSERT AND THE OTHER IS USED FOR SOAKING THE ANNEALED CASTINGS

cover allow the three lugs on the cage to extend through. A chain is attached to eyes in the lugs on the cage and the whole is lifted from the pit by the air hoist and transferred to the soaking pit to the left, Fig. 8. The cover is removed and the lid of the pit closed, swinging on a hinge and supported by a counterweight shown above. The castings are allowed to remain in the cooling pit the same length of time as is required for the anneal. When taken from the soaking pit the castings are below 800 degrees Fahr. The idea of the soaking pit is to enable the electrically heated portion of the furnace to operate continuously.

The efficiency of the electrical equipment will not be determined until the plant is on a normal rate of producton and will depend upon what is decided upon as normal. The rate for electric power is fixed by two factors, the total amount of power used and the highest amount required at any one time. This latter is what is known as the demand charge and is secured by taking the five hours which the recording watthour meter indicates as the highest for the month. The lowest and highest of these five readings are then discarded and the demand charge is based on the average consumption for the three other hours. If all the equipment was operated at the same time this demand charge would be high, therefore, at present the annealer is operated only at night when the melting furnace is not used.

The consumption charge rate is based upon the amount of power used, that is, the more power consumed during a month the lower will be the rate per kilowatt hour. Therefore, when the plant is operated more nearly on a steady basis, the power cost will be lighter for the amount of work accomplished. Another way in which the power cost will be lowered by more constant operation is in starting a heat or an anneal in a hot furnace.

When Contracts May Be Canceled

(*Concluded from Page* 558)

to purchase, there is no contract.

However, a mistake of fact on the part of one of the parties does not render the contract void. It is in full force and effect provided one party has acted in entire good faith and has not made a mistake as to the object contemplated. The contract may be enforced, unless its enforcement would amount to an injustice to the one making the mistake. This latter rule obtains in some jurisdictions but not in all. Mistakes as to the law involved is not sufficient ground for the cancellation of contracts. Ignorance of the law is no excuse.

The mere fact that performance is difficult is no excuse. That point has been decided so many times as to be almost impossible to overturn in court. The mere fact that markets have declined and business men are going to find it hard to meet their contracts, is no excuse as to why they should be permitted to cancel them. To permit cancellation of a contract merely because one party finds it difficult to perform his share of it, would be to overturn the entire contractual theory of the law.

Many business men have doubtless saved themselves from ruin by taking prompt action in cancelling their contracts before it was too late. A contract may be canceled any time before it has been acted on or accepted by the other party, but as soon as the other party has accepted it and taken steps to carry out his share of it, cancellation cannot be made.

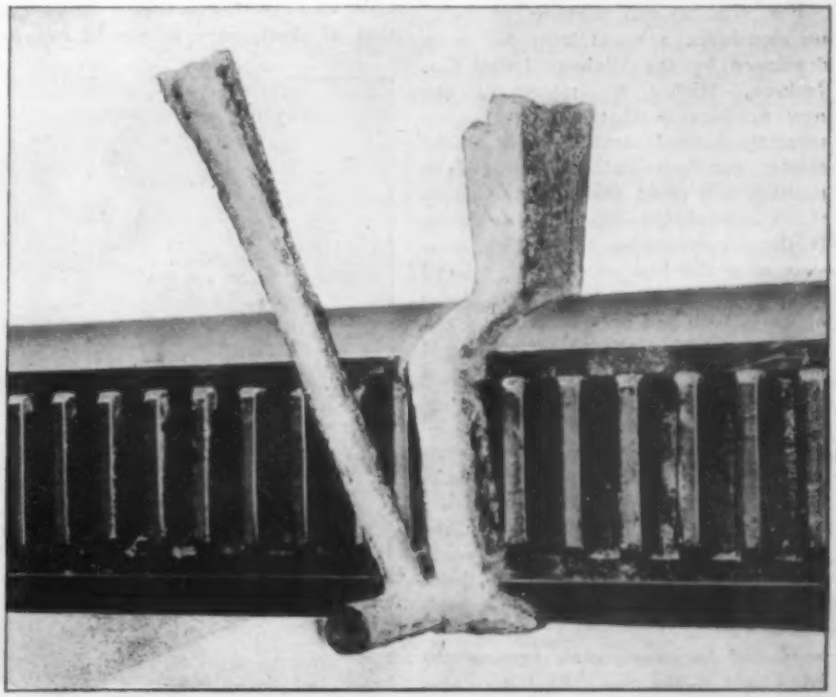
It may be the part of wisdom in a crisis to try and avoid losses, but it finds no sanction either in law or morals. One party is no better than another and the law will never permit one party to avoid losses by canceling his agreements and throwing such losses on the other party. The whole machinery of the law is organized to prevent this very thing. And the men at fault, who have wrongfully cancelled their agreements, or attempted to do so, will not be allowed to come into court and seek redress upon such grounds. "He who comes into court must come with clean hands," is a maxim as old as the law itself.

Stripping Plungers Cast in Three Sections

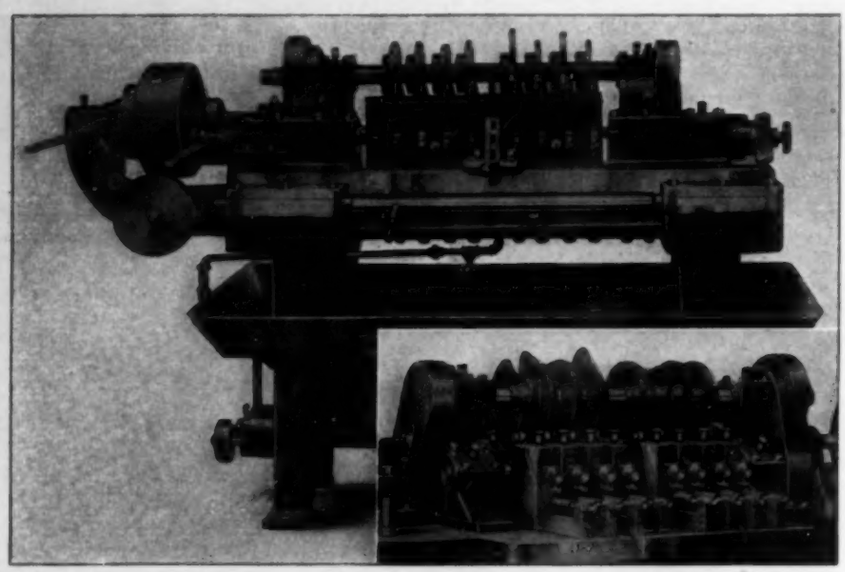
Ingot stripper plungers are extremely difficult to cast, owing to the fact that the cylinders, 18 inches diameter, and 25 feet or more long, have walls only 1 inch thick. Inasmuch as it is almost impossible to obtain a perfect core and then anchor it so as to prevent floating, the thickness of the metal often is reduced on certain sides, thereby weakening it and resulting in breakages.

A plunger casting can be made much easier and of more uniform thickness by casting in three 10-foot cylinders, instead of in one piece, and then welding the parts together by the thermit process. All three welds can be machined at the same time. As the outside of the cylinder must be machined anyway, practically no more machining is required than if the plunger were cast in one piece. Plungers have been welded successfully in this manner for the past 10 years.

The accompanying illustration shows a welded joint of an ingot stripping



AN INGOT STRIPPING PLUNGER MADE IN THREE 10-FOOT CYLINDERS AND THE JOINTS WELDED, ONE OF WHICH IS SHOWN BEFORE BEING MACHINED



FRONT VIEW OF LATHE WHICH TURNS ALL CAMS AT ONCE. (INSET) SHOWS BACK OF LATHE AND METHOD OF EMPLOYING THE MASTER CAM

plunger which is made in three sections.

Locomotive frames of unusual length and other long sections, which are difficult to cast all in one piece also can be cast in shorter lengths and these sections welded together. By using this method smaller foundries can undertake this work, although the number of parts to be welded will depend on the size of the foundry and available mold and pattern facilities.

Unique Lathe Turns Cams at Single Operation

For simultaneous turning of cams on camshafts, a novel lathe has been developed by the Walcott Lathe Co., Jackson, Mich. A feature of the new machine is that a shaft having correctly formed cams is used as the master camshaft and when placed in position will effect the reproduction of shafts indefinitely. The lathe, as shown in the accompanying illustration, consists of a flat bed on which is placed all of the mechanism for turning shafts of any length and number of cams. A pan for catching the chips is located immediately under the bed while below it is a tank cutting compound.

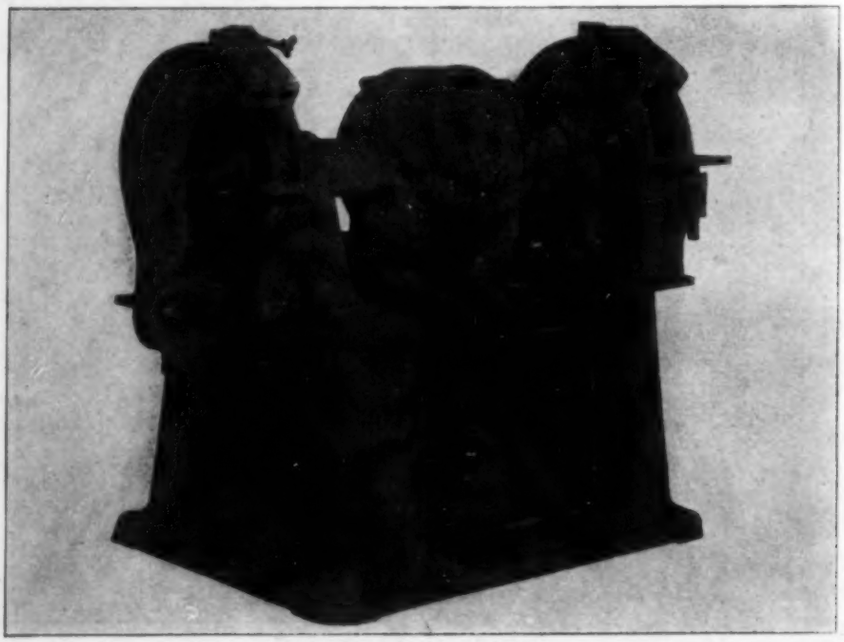
The camshaft to be turned is placed in the lathe from the front or operating side and is centered between chucks of the collet type, both of which drive. Springing of the shaft away from the cutting tools is prevented by a steady rest against the center bearing. Since all the cams are turned at once, each has a cutting tool which moves forward and backward while turning the lobed part of the cam. Each tool also has a tilting motion while cutting the sides of the lobe in order that the clearance and top rake always will be the same. Reciprocating motion of the tools is provided by the master cam which is located on the back side of the machine at the same level as the shaft to be turned.

Both shafts revolve at the same speed, consequently the cams on the shaft to be turned must be the same in outline and angular position as the master cams. Feed of the machine is automatic, thus the duties of the operator are to place the shaft in the machine, throw in the clutch lever and move the work table to its rough turning position. All further operations take care of themselves. It is said that 25 shafts may be turned out per hour since less than two minutes is required for each shaft. A 5-horsepower motor is sufficiently large to care for all power requirements.

Heavy Duty Grinder Has Rapid Adjustment

For dry grinding work, the Marschke Mfg. Co., Indianapolis, has designed a heavy duty, ball bearing grinding machine which is capable of rapid adjustment. A feature of the machine is that the hoods covering the wheels are adjustable to bring the grinding wheel always to the front of the hood. Turning the small handwheel, shown in the accompanying illustration, raises and lowers the steady rest and automatically adjusts the spark plate. The wheels are 18 x 3-inch.

The machine shown in the illustration is equipped with an exhaust fan although this detail may be omitted. This exhauster is mounted inside of the base and operated by a high-speed chain drive, the whole device being inclosed in a housing as a protection from dust and grit. The hood support which serves as the outer ell for the exhaust has an opening directly underneath which may be used as a cleanout or may be opened so that when grinding brass, the heavy cuttings may fall through into a container placed below. Starting equipment is mounted on the back of the door only the handle extending to the outside. Opening the door provides accessibility to the blower.



THE GRINDING WHEEL IS KEPT AT THE FRONT BY ADJUSTING THE HOOD

Late News of the Societies

Notes on Past and Coming Meetings of National and Local Trade and Technical Organizations

CONSIDERATION of dust explosions, crane overhoist limit stops, signals and signaling and the relation of boiler accessories to safety will be discussed by the engineering section of the National Safety council at its meeting in Philadelphia, Feb. 28. All information available to the National Safety council will be gathered for consideration at this meeting.

The engineering section will meet jointly with the Philadelphia section of the American Society of Mechanical Engineers and the Philadelphia local safety council. Members of the Philadelphia section of the Association of Iron and Steel Electrical Engineers also have been invited. In the evening two formal addresses will be made followed by general discussion. Prof. Dexter S. Kimball, of the engineering college, Cornell university, will speak on "A Broader Field for the Engineer" and L. A. DeBlois, of E. I. du Pont de Nemours & Co., Wilmington, Del., will speak on "The Fundamental of all Engineering."

* * *

Hears National President

The Hartford chapter of the American Society for Steel Treating met at the City club, Hartford, Conn., Thursday evening, Feb. 10, to hear a paper on "alloy steel, its rise and secrets" by A. E. White, professor of metallurgy, University of Michigan and president of the society. On Feb. 24, the postponed meeting for the discussion of wrought iron will be held. Carl T. White of New Britain is secretary and treasurer of the chapter.

* * *

Will Award Edison Medal

At the annual midwinter convention of the American Institute of Electrical Engineers, at the Engineering Societies' building, New York, Friday evening, Feb. 18, Dr. M. I. Pupin, Columbia university was awarded the Edison medal of the Edison association. Dr. Pupin has gained prominence through the invention of telephone and transmission apparatus and is presented the medal "for his work in mathemetical physics and its application to the electrical transmission of intelligence." Following the presentation ceremony, Dr. Pupin delivered a lecture on "Wave Transmission."

* * *

Boston Engineers Attend Dinner

President F. D. Hall, electrical engineer for the Boston & Maine railroad, presided at the dinner of the Boston chapter of the American Association of Engineers held Feb. 10 at the Boston City club. Dr. F. H. Newell chief engineer and director of the United States reclamation service under President Roosevelt and past president of the American Association of Engineers told of the aims of the association, which now has more than 25,000 members in all parts of the country. Other speakers were: Col. R. K. Hale of the Massachusetts waterways commission; and Prof. George F. Swain of the Harvard Engineering school.

* * *

Announce Plans for Meeting

Announcement is made of dates for the annual convention of the National Metal Trades association at the Hotel Astor, New York, April 18 to 21. The meeting will open Monday, April 18, with the executive committee and the local secretaries gathering at 10 o'clock and a dinner for the latter will be served at 7 o'clock. Tuesday the administration council and the local secretaries will meet at 10 o'clock with a joint luncheon of these groups and the local presidents at 1 o'clock. The alumni dinner will be served at 7 o'clock. The convention sessions proper will be held at 9:30 and 2 o'clock Wednesday and Thursday. The annual banquet will be at 7 o'clock Wednesday. A theater party for ladies will be provided for Wednesday afternoon.

* * *

Societies Hold Joint Meeting

About 600 members of the Boston Society of Civil Engineers, the Boston sections of the American Society of Mechanical Engineers and the American Institute of Electrical Engineers, attended the final joint meeting of the societies at the Boston City club on Feb. 7, for a discussion of "Power Development in New England." W. M. White of Milwaukee spoke on "Recent Waterwheel Developments and Settings," and W. B. Powell of Boston discussed "Design of the Steam Power Stations for Hydraulic Relay". R. J. S. Piggot of Boston also spoke.

* * *

Mining Engineers Elect

At the annual meeting of the metallurgical and mining section of the Engineers' Society of Western Pennsylvania, held at the William Penn hotel, Pittsburgh, recently, J. D. Martin, chief engineer of the Hillman Coal & Coke Co., Pittsburgh, was elected chairman to succeed J. W. Paul, mining engineer, United States bureau of mines, Pittsburgh. In his address the retiring chairman discussed all phases of coal mine explosions, their occurrence, the importance of gas and dust as factors, the sources of ignition, etc. Thomas W. Dawson, chief engineer of the H. C. Frick Coke Co., Scottdale, Pa., was elected vice chairman, and the following five new directors were elected for the ensuing year: H. H. Rankin, civil and mining engineer; W. A. Weldin, of Blum-Weldin & Co.; J. S. McDowell, manager for the Harbison-Walker Refractories Co., and N. F. Hopkins, of Harrop & Hopkins, all of Pittsburgh; and R. R. Hice, state geologist, Beaver, Pa.

Convention Calendar

Feb. 24-26—National Machine Tool Builders association will hold semiannual meeting at Cleveland hotel, Cleveland.

April 20-21—National Metal Trades association. Annual convention, Astor hotel, New York. Homer D. Sayre, Peoples Gas building, Chicago, is secretary.

April 21-23—American Electrochemical society. Spring meeting at the Hotel Chalfonte, Atlantic City, N. J. Joseph W. Richards, Lehigh university, Lehigh, Pa., is secretary.

May 5-6—British Iron and Steel institute. Spring meeting at the Institution of Civil Engineers, Great George street, London, S. W. 1. The secretary is George C. Lloyd, 28 Victoria street, London, S. W. 1.

May 9-10-11—American Association of Engineers. Annual convention to be held in Buffalo. National association headquarters, 63 East Adams street, Chicago.

May 19-20—National Machine Tool Builders' association will hold its spring convention at Hotel Traymore, Atlantic City, N. J. Date advanced to Feb. 24-26. See above.

May 23-26—American Society of Mechanical Engineers. Spring meeting, Congress hotel, Chicago. Calvin W. Rice, 29 W. Thirty-ninth street, New York, is secretary.

Large Credit

Recently Voted to Foreign Customers of Steel Corporation Says Gary

Credit to its foreign customers to the amount of $20,000,000 recently was voted by the United States Steel Corp., according to Chairman E. H. Gary in a talk with newspapermen Feb. 17. This statement was elicited by a question as to what Judge Gary thought of foreign trade finance corporations:

"I am in favor of anything that will stimulate the purchase of goods," said Judge Gary. "It seems to me that private enterprise can and should assist foreigners in handling their goods by extending suitable credits to them. The Steel corporation passed a resolution to extend credits to foreigners to the amount of $20,000,000. I do not know exactly to what countries these credits were granted. The corporation is doing a good business with Canada, Mexico, China, Japan and some of the South American republics. In fact, the Steel corporation manages to do a good export business at all times. Some of it is done on a credit basis but most of it in the regular way.

"In regard to foreign competition after the European iron and steel plants have been rehabilitated," continued Judge Gary in reply to others questions, "it will largely depend on wage rates. If the rates abroad should be as near our rates as they are at the present time, I should not think this country need fear any serious or harmful competition. The principal advantage which foreigners had over producers in the United States heretofore was found in their very low rate of wages. If they should go back to those low rates then there ought to be a reasonable protective tariff that would maintain our manufacturers on a parity with those abroad so as to enable them to maintain fair and reasonable living wages."

Price cuts by independent steelmakers, said Judge Gary have not materially affected the Steel corporation's business. Asked if all of the Steel corporation's contracts were "firm," Judge Gary replied that they were, but that this did not prevent some readjustments at times; he added that he thought there had been very little of that of late.

Judge Gary said he doubted whether any of the steel manufacturers who have cut their prices considerably have increased their sales to any appreciable extent. On the contrary, he thought, they have been the means of decreasing the grand total of sales. He reiterated his belief that a general reduction is justifiable only when the level is too high and he stated that he did not favor cutting wages until the cost of living has been brought down, asserting that such action is wrong in principle.

Questioned whether he thought, as some other steel makers did, that a reduction in freight rates was essential to a revival in the industry, Judge Gary replied, "I think we have never asked for a reduction in freight rates."

New Southern Plant Will Concentrate Ores

Linden, Texas, Feb. 22.—Construction of a 400-ton iron ore crushing, screening and roasting plant at Bowie Hill, near here, by the Pratt Bros. Iron Ore Development Co., Minneapolis, is in progress. The company plans later to install the magnetic process of treating the ore. It is estimated that the property at Bowie Hill contains between 5,000,000 and 6,000,000 tons of iron ore and that other holdings of the company in the county will yield a larger amount. The ore contains about 54 per cent iron and 4 per cent aluminum. The plant has track connection with the Texas & Pacific railroad and will obtain a natural gas supply from the Southern Gas Co., Cass, Texas.

The ore will be mined with a steam shovel, conveyed to the bar screen where the fine ore will be broken into 1½ to 2-inch pieces and then hoisted to the rolls where it will be crushed to a ½-inch size and dumped into a bin. This crushed ore with other loose ore will be fed next into the rotary kiln at the rate of 20 tons an hour where the roasting will take place. The ore will then go onto another screen for final separation.

To Name Receivers

Alleged failure of the United States shipping board to make payments due the Pusey & Jones Co., shipbuilding company and subsidiary of the Hannevig & Co., an involuntary petition in bankruptcy has been filed against the parent company, which is a foreign exchange and shipping firm of New York City, and against Christoffer Hannevig individually. The appointment of receivers has been agreed to by Hannevig and the proceeding is said to be due to the desire to conserve the company's assets. The shipping board is alleged to owe Pusey & Jones $14,000,000. The shipping board has awarded the company $7,100,000 but this was refused and suit has been instituted to collect the larger amount.

To Protect Holders

A committee for the protection of the interests of stockholders of the National Conduit & Cable Co Inc., has been formed at the request of a number of stockholders of the company. Formation of the committee follows the communication sent Feb. 14 to stockholders of the company, calling their attention to the fact that "unless the default in certain covenants of the first mortgage bond issue is remedied by March 15, 1921, the banking houses which originally purchased these bonds will ask the trustees to take immediate action." The committee is made up as follows: Chairman, M. P. Gallaway, Vice-President of the Guaranty Trust Co. of New York; Stephen C. Millett, of Millett, Roe & Hagen; Edward W. Harden, of J. B. Colgate & Co.; Hugh K. Pritchitt, of Prichitt & Co., and Harold D. Bentley, investment trust officer of the Guaranty Trust Co. of New York. The company had a deficit last year of $1,222,752 after deducting charges and taxes, compared with the previous year's deficit of $1,116,340.

Expect Action On Bill

Washington, Feb. 22.—Backers of the Winslow bill, which would enable the treasury to make partial payments to the railroads under the Transportation act, are hopeful of favorable action in the senate this week. The bill, which was passed by the house last Tuesday, would release to the carriers approximately $400,000,000 due for the guaranty period but withheld by a technicality. Of the $634,000,000 owing to the railroads, only $263,826,157 had been paid by the treasury up to Feb. 11. It is estimated that the $400,000,000 to be released will be turned over six times in payment of accounts of railroads and interests supplying them.

Will Rebuild Two Stacks

Plans have been completed by the Wheeling Steel Corp. for rebuilding and remodeling its No. 1 La Belle stack, Steubenville, O., and its Martins Ferry stack at Martins Ferry, O. Improvements at the La Belle furnace will include the enlargement of the stack for increased capacity, relining the hot blast stoves and the installation of a new gas cleaning system complete with new uptakes, downcomers, a dust catcher and a gas washer of the Brassert type.

At the Martins Ferry furnace the hand filling equipment will be replaced with a modern top for more uniform stock distribution and with a skip bridge. Improvements will consist of reconstructing and enlarging the furnace proper, relining the hot blast stoves and installing a Brassert type gas washer also. The work will be in charge of Freyn, Brassert & Co., Chicago, who have been engaged by the Wheeling Steel Corp. as consulting engineers.

Wages and Employes Decrease

Reduction of 17.8 Per Cent in Personnel and 23.1 in Payroll in Steel Industry Noted by Bureau of Labor, Comparing Conditions in December and January—Automobile Plants Employing More Men, But at Reduced Rates

WASHINGTON, Feb. 22.—One hundred and three iron and steel plants which in January 1920, were employing 143,062 persons, in January of this year were employing only 106,676. In these same plants, and for a half-month period, the January, 1920, payroll totaled $10,130,780, and in January, 1921, had dropped to $8,011,217. The decrease in personnel in January this year was 25.4 per cent and in amount of payroll, 20.9 per cent.

A survey of iron and steel plants in which January is compared with December, 1920, also has been made by the bureau of labor statistics of the department of labor. One hundred and five plants, reporting for both months, were employing 108,949 persons in January against 132,485 in December. The January payroll totaled $8,127,446, against one of $10,564,361 in December. Thus, comparing January with December, the cut in personnel is 17.8 per cent and in amount of payroll, 23.1 per cent. The comparisons in all cases are for half-month periods.

Of the 14 industries, including iron and steel, surveyed by the bureau of labor statistics, all were employing fewer persons in January this year than in January last year, while in 12 of the 14 industries the payrolls were lower. Twelve of these 14 industries were employing fewer persons in January than in December, while 13 had decreased payrolls.

Thirty-nine automobile plants were employing only 26,044 persons in January, 1921, compared with 73,673 in January, 1920. A slight upturn, however, is evident in the January-December comparison. Forty plants which in December had only 24,377 on their payrolls, had increased this number 2.5 per cent to 24,977, by January. Despite this addition of 600 to the working forces, the payroll for a one-week period fell from $727,736 in December to $711,442 in January, a loss of 2.2 per cent. This is the first time the department of labor's survey has revealed, in the present readjustment period, an increased labor force and a decreased payroll.

Car building and repairing plants in January were employing 42,573 persons, against 48,577 in December, these figures pertaining to 45 plants. Forty-six car-building and repairing plants in January were employing 44,613 persons, against 47,199 in the same plants in January, 1920. Comment on the iron and steel industry, by the bureau of labor statistics follows:

"Iron and steel: Wage rate decreases ranging from 20 to 25 per cent were made to all employes in one establishment. Three plants reported a decrease of 20 per cent, affecting all employes in the first plant and 90 per cent in the second. The number affected in the third plant was not stated. A reduction of 15 per cent was made to the entire force in three mills, while another mill reduced the wages of all employes 12 per cent. In two plants time and one-half was eliminated, resulting in a decrease in earnings of 13.7 per cent in one plant, while the approximate decrease was not reported by the other plant.

"A decrease of about 10 per cent was reported by three concerns affecting all men in the first concern, 95 per cent of the men in the second, and about 80 per cent of the men in the third concern. In one mill a 10 per cent bonus to all day men and piece workers was discontinued. The time men in one establishment were reduced about 15 per cent. A decrease of approximately 2 per cent was reported by three plants, affecting 40 per cent of the force in two plants and 30 per cent in the third plant. Due to lack of orders, many establishments were partially closed, and the per capita earnings reported for this month show a decrease of 6.4 per cent compared with last month."

Keep Pittsburgh Open Shop Is Slogan

Speaking on the subject "What the Open Shop Means to Pittsburgh," before the Pittsburgh board of trade, recently, William Frew Long, vice president and general manager, Employers' association, of Pittsburgh, said:

"Some 23 years ago owners of the foundries and machine shops of the city organized for the purpose of trying to deal collectively with the Iron Molders' union and the International Association of Machinists. Needless to say, they failed, although they gave it a fair trial, and I guess you will concede that seven years of honest endeavor to make an agreement that the unions would live up to, constitute a fair trial of the kind of collective bargaining that bears a union label.

"They found out that no union leader ever intended to keep an agreement unless it was profitable for him to keep it, and in 1905 began to operate on an open shop basis, and have operated that way ever since. In the 16 years since that time, the workers have been better paid and better satisfied in every way.

"In the early part of 1916, other industries signified their desire to help in the work of keeping Pittsburgh open shop and the name of the Manufacturers' Association of Pittsburgh was changed to the Employers' Association of Pittsburgh, and since that time we have grown until every industry in the city is represented in our membership. The purpose of the association is to keep Pittsburgh open shop.

"Some people have said that our purpose was antiunion in spirit, but we have no such passive purpose as that. I could take you into shop after shop of our members and you would find that 40, 50, 60 and even up to 80 per cent of the men are members of some union; shops in which no man is questioned as to whether he is a union or nonunion man, Jew or Gentile, Catholic or Protestant. There is nothing antiunion about that. We are pro-open shop and proamerican, and antieverything and everybody that interferes with the right of a man to work without paying tribute to a labor agitator."

Pays Bonuses in Bonds

The General Electric Co., has distributed among 6000 employes of the Lynn, Mass., works $100,000 in 7 per cent bonds of the company, representing 5 per cent bonus due them upon their earnings since July 1. It was paid to those who have worked for the company five years or more. The decision to pay the bonus in bonds instead of in cash was made by the directors because of the belief that it would encourage thrift. Announcement has been made by the company that it will continue for another year its employes' group life insurance plan. The same terms will prevail as heretofore. During 1920, the first year of the operation of the plan, about $257,500 was paid in death benefits.

Enameling Earnings Less

The annual report of the National Enameling & Stamping Co. shows a balance of earnings for 1920 of $3,539,000 a decrease of $444,922 from the preceding year. The company's gross profit was $4,898,651 a decrease of $738,206 from 1919. The company's total surplus now stands at $9,957,247, it is said.

Wage Cut Less Than Living Cost

National Industrial Conference Board Retail Index Now 76 Per Cent Above 1913—Steel Wages from 91 to More Than 140 Per Cent Above—Credit Movement Continues—General Financial News

BY JOHN W. HILL, FINANCIAL EDITOR

THE uninterrupted improvement in the reserve position of the federal reserve system during February has reflected the fundamental soundness of conditions despite the many conflicting and perplexing developments which have featured the month. No definite trend in trade has been indicated because of the offsetting considerations. Strength has appeared in some lines such as textiles, rubber, sugar and silk, where deflation, beginning early, has been exceptionally severe. This movement has been counteracted by the stagnation in the basic iron and steel industry and the falling prices for paper, petroleum and other lines which escaped the trend of readjustment until recently. The present cross currents in industry mean that the unbalanced economic structure is slowly but surely regaining the equilibrium necessary for healthy activity.

In all former economic crises in this country the banks have weakened together with business. Since Dec. 23, 1920, however, the credit situation has made steady improvement. Last week the reserve ratio of the entire federal reserve system stood at 50.3 per cent, a gain of 5 points above the December ratio, 7¼ points above the same week a year ago and only 2 points below the same week of 1919, before the wild era of speculation began. This condition bespeaks an easier situation, although most authorities look for relatively high rates for some time. This is due to the vast amount of credit "frozen" in commodities, in supporting temporarily embarrassed industries, and in unfunded export loans. In addition, the domestic and foreign investment demand is enormous and is serving to absorb much of the credit slack as it appears. The war exhausted the world's liquid capital and some time will elapse before this loss is repaired.

Of great interest are the reports of wholesale and retail price indexes by the governments bureau of labor statistics and the National Industrial Conference board respectively. The Conference board reports that on Feb. 1 the cost of living for the average workingman's family in the United States was 76 per cent above the prewar level. This shows a drop of 14 per cent from the peak of 105 per cent above 1913 reached in July last year. In the steel industry wages have been advanced to more than 140 per cent above the 1913 basis. Even with the reductions effected by some of the independent companies the wage level still is about 91 per cent more than in prewar years. This clearly shows that fully-employed labor has not suffered in purchasing power from the wage cuts thus far made. The wide margin between the cost of living and the present level of wages, coupled with the fact that living costs still are declining, forecasts still further wage deflation.

The bureau of labor statistics weighted index of wholesale prices for Feb. 1 stands 77 per cent above 1913. This is a decline of 6 1/3 per cent during the month and 35 per cent from the peak reached in May. At the present, commodities as wholesale are 28½ per cent cheaper now than on the corresponding date one year ago. In January it is significant that building materials and house furnishings show the largest declines from the previous month, the former dropping 10 per cent and the latter 18 per cent. These lines have been among the most stubborn in resisting deflationary tendencies.

Receiver Is Named

George C. van Tuyl Jr., New York, has been appointed in New York, Connecticut and Rhode Island, receiver for the American & British Mfg. Co., a $10,000,000 New York corporation, operating plants in Providence, R. I., and Bridgeport, Conn., for the building of steam, oil and fire engines and general machinery. The appointment was made on complaint of the American & British Securities Co., a Delaware corporation, and other creditors, with claims aggregating $37,516. They allege that the company was financially embarrassed at present, although completely solvent.

Sees More Deflation

Earnings of the Falcon Steel Co., Niles, O., in 1920 after cash dividends, depreciation and reserve for federal taxes were $888,000, President Lloyd Booth announced at the annual meeting of stockholders. Initial operations were March 1, 1920, and shipments for the ensuing 10 months 42,000 tons of black and blue annealed sheets. There is outstanding $1,000,000 of preferred and $1,200,000 of common stock. The by-laws were changed at the meeting so as to have the annual meeting hereafter the fourth Tuesday of September instead of in February owing to the end of the fiscal year coming on June 30. President Booth informed stockholders that in his opinion the steel market is not yet shaken down and that it may be some months before profitable operations will appear.

Baldwin Head Looks for Early Stabilization

President Samuel M. Vauclain of the Baldwin Locomotive Works, looks forward with confidence to an early stabilization of the company's business he tells stockholders in his annual report on operations for 1920. Notwithstanding the present unsatisfactory conditions of business generally he says "there is every reason to believe that your works may be operated at the same percentage of their capacity during 1921 as they have been during the year just closed."

The comparative income account follows:

	1920	1919
Gross sales	$73,547,666	$84,307,776
Cost	65,987,827	75,465,535
Manufacturing profit	7,554,839	8,842,241
Other income	4,200,361	1,103,430
Gross profit	11,755,200	9,943,671
Taxes, interest, etc.	3,347,931	1,074,428
Profit	8,407,269	8,871,243
Depreciation, federal taxes, etc.	1,100,000	3,095,000
Res. defer. profit	2,878,751	.....
Net profit	4,428,518	5,776,243
Preferred dividends	1,400,000	1,400,000
Common dividends	1,400,000	700,000
Surplus	1,628,518	3,676,243
Previous surplus	6,554,413	1,907,642
Eddystone munitions liquid	1,515,265	.....
Unexpended reserve	1,315,241	1,869,827
Surplus	11,013,437	6,554,413

The general balance sheet as of Dec. 31, 1920, shows net current assets of $57,510,112 and liabilities of $25,960,000. Of the net current assets inventories account for $16,321,000 while accounts receivable aggregate $18,517,000.

Republic Head Foresees Buying Resumption

Although present demand for steel is extremely narrow, the purchasing power of the country has not been seriously impaired and the pressing re-

quirements for housing, transportation, and general purposes, should cause a resumption of buying once confidence is restored and the credit situation relaxes, says John A. Topping, chairman of the board of the Republic Iron & Steel Co., in the company's annual report for 1920. Sales in 1920 of $76,342,219 were the largest in the company's history and compare with $45,872,344 in 1919 and $75,224,110 in 1918. Business continued good until the fourth quarter, the report states.

Net profits of the company for the year amounted $7,616,522 compared with $2,141,197 in 1919 and $8,530,116. The company reports that on Dec. 31 unfilled orders for finished and semi-finished steel amounted to 162,906 tons compared with 389,524 tons one year before and 143,383 tons two years ago. Pig iron unfilled bookings amounted to 35,772 tons at the close of the year against 96,855 tons one year before and 63,132 tons on Dec. 31, 1918.

The annual report shows that the company earned net profits of $14,174,163 in 1920 compared with only $5,031,838 in 1919. Deductions for depreciation, depletion, taxes, interest and reduction of inventory values amounted to $6,557,641. After dividend allowances the sum of $505,922 was charged to surplus on account of 1917 income taxes leaving a final surplus for the year of $3,560,000 and a total profit and loss surplus of $37,441,571. The comparative income account follows:

	1920	1919
Net earnings	$13,825,521	$4,456,341
Other income	348,642	575,496
Total profit	$14,174,163	$5,031,837
Depreciation	1,506,260	1,381,220
Min. exchange	508,062	315,113
Federal tax, etc.	1,812,835	315,113
Investment received	$1,992,517	.....
Interest	737,967	733,403
Balance	$7,616,522	$2,141,196
Preferred dividends	1,750,000	1,750,000
Common dividends	1,800,000	1,632,687
Surplus	$4,066,522	*$1,241,491
Previous surplus	33,880,972	35,122,462
Total surplus	$37,947,494	$33,880,971
Written off	†505,923	.....
P. & L. surplus	$37,441,571	$33,880,971

*Deficit. †For 1917 taxes.

The property account of the company is now listed at $90,675,599, the sum of $4,962,668 having been expended for new construction in 1920. Total new construction up to 1920 amounts to $46,433,460. Working assets on Dec. 31 stood at $25,593,878, of which $6,600,000 represented cash and government bonds. The working capital of the company in 1899 was $6,500,000. Production last year exceeded 1919 but was smaller in most departments than in 1918. The summary of production follows:

	1920	1919	1918
Coal, net	2,195,912	1,942,067	2,118,103
Iron ore, gross	1,677,699	1,272,707	1,512,071
Coke, net	980,484	959,602	1,207,896
Limestone, gross	58,462	47,955	78,777
Pig iron, gross	972,188	791,597	1,030,411
Bessemer ingots, gross	502,177	433,687	615,970
Open hearth ingots, gross	482,776	318,730	503,732
Total ingots, gross	984,953	752,417	1,119,702
Finished and semi-finished products, net	1,004,189	702,040	1,024,040

Wage rates attained their highest level last year. The increase since 1915 in average wage per man has been 184 per cent according to the company's record. The following table discloses the total annual payroll and the average wage per man since 1915:

Year ending	Amount	Average per man
Dec. 31, 1920	$28,972,720.15	$2190
Dec. 31, 1919	21,466,605.56	1822
Dec. 31, 1918	23,747,260.97	1619
Dec. 31, 1917	17,574,480.56	1211
Dec. 31, 1916	12,778,836.21	979
Dec. 31, 1915	8,558,574.01	771

According to Chairman Topping the fourth quarter brought a cessation of demand and heavy cancellations of orders. Earnings in the final three months of 1920 were affected by reduced shipments and by inventory shrinkage. All inventories on hand have been marked down to current market prices. A large percentage of the inventories is in iron ore.

Pressed Steel Car Sees No Break in Output

With a comfortable amount of business on the books of the Pressed Steel Car Co., President F. N. Hoffstot in his annual report for 1920, expresses the belief that the company's plants will be able to maintain operations this year without a break. Earnings of the company last year amounted to $2,531,000 after charges and taxes against $4,265,000 in 1919. Inventories reveal a large increase over 1919 the total on Dec 31 standing at $11,237,000 compared with $3,595,000 one year before. Notes and accounts receivable were $9,052,000 against $6,818,000 at the end of the previous year. On the debit side of the balance sheet accounts and bills payable are carried at $14,080, against only $4,224,000 in 1919. The comparative income account follows:

	1920	1919
Profits	$3,194,277	$5,338,640
Depreciation, etc.	662,472	1,073,408
Balance	*$2,531,805	*$4,265,232
Preferred dividends	875,000	875,000
Common dividends	1,000,000	1,000,000
Surplus	$656,805	$2,390,232
Previous surplus	14,464,188	12,704,412
Total surplus	$15,120,993	$15,094,644
Obsolescence and amortization	.....	630,436
P. & L. surplus	$15,120,993	$14,464,188

*After Federal taxes.

In his remarks to stockholders President Hoffstot said that earnings for 1920 include the final adjustment of most of the contracts with the government, but that one or two still remained open which the company hoped to settle in the next few months.

"In the early fall it looked as if there would be a considerable buying movement, but the action of the government in failing to make partial payments tied the railroads hands and has made it very difficult for them to carry out commitments and prevented them from entering into new ones," says President Hoffstot. About 60,000 cars were ordered during the year and 25 per cent of these were bought by private owners in order to protect the execution of their obligations. This condition of affairs with inefficiency and lack of co-operation on the part of labor has helped to bring abut a depressin which will last until there is a readjustment."

Financial Crop Ends

JOHN L. Weeks and Robert D. Wood, receivers for the Sheffield Iron Corp. have given notice to creditors that all claims must be filed by March 20, with the receivers at their office at 70 Broadway, New York. The receivership was ordered by the federal district court of New York following a suit filed by the Harbison-Walker Co., one of the creditors.

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George E. Weller and John A. Thiele have been appointed receivers for the S. T. and G. A. Gebhart Co., dealers in iron and steel products. The receivers gave bond of $10,000 each and will operate the business under the direction of the court.

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Net earnings after all charges and federal taxes as reported by the Stewart Warner Speedometer Corp. for 1920 amounted to $2,210,928 compared with $1,963,574 in 1919. The year's surplus after dividend payments was $615,927.

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Net profits after federal taxes and other charges of $872,703 are reported by the Emerson-Brantingham Co., Rockford, Ill., for the year ended Oct. 31, 1920. This compares with $1,322,420 in 1919. The company manufactures farm implements.

* * *

The Fiala Arms & Equipment Co. with factories in New York and New Haven, Conn., has leased the Middletown Fire Arms Co., Middletown, Conn., and will consolidate it with its New Haven plant. The machinery and equipment now is being moved.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

COMLY B. Shoemaker, 2nd, who succeeds his father, Comly B. Shoemaker, as president and general manager of the Glasgow Iron Co., Pottstown, Pa., with headquarters in the Harrison building, Philadelphia, has been with the company 10 years, the last two of which were as second vice president. The elder Shoemaker, who was one of the original directors of the company and its first treasurer, had been president and general manager since 1887. At the recent meeting he requested he be not re-elected and was made chairman of the board of directors. Robert Shoemaker Jr., first vice president of the company, continues as vice president.

L. W. Hench has been appointed secretary and general manager of the International Oxygen Co., succeeding Eugene Schoen, resigned.

W. J. Core, associated with the General Motors Corp. at Detroit, has been elected secretary of the Maibohm Motors Co., Sandusky, O., succeeding I. O. Boorman, resigned.

Charles M. Schwab was received by Pope Benedict in Rome on Feb. 15. The American steelmaker during his talk with the Pontiff, recalled visits he had enjoyed with two former Popes, Leo XIII and Pius X.

L. M. Billingslea has been attached to the Cleveland office of Rogers, Brown & Co. as a salesman. He was formerly located at the Chicago office of Rogers, Brown & Co. in a similar capacity.

Robert Field has retired from the Field & Bruner Co., Kokomo, Ind., pig iron, steel, coal and coke. The firm has been dissolved and the business will be continued by Harry A. Bruner under his own name.

Arthur G. McKee, of Arthur G. McKee & Co.; A. G. Tame, vice president of the Cleveland Trust Co.; and George W. Burrell, vice president and works manager, have been elected directors of the Wellman-Seaver-Morgan Co., Cleveland.

Hubert E. Hartman, assistant secretary and general attorney for the Ford Motor Co., Detroit, has announced his resignation effective March 15. He will enter business for himself but will continue some connection with the Ford company.

Harold B. Smith, professor of the electrical engineering department of the Worcester Polytechnic institute, Worcester, Mass., who has been ill since Christmas, has recovered sufficiently to leave on a southern trip. He has sailed for Porto Rico, where he will remain a month.

H. Oliver Williams, recently appointed assistant to the general superintendent of the Cambria Steel Co., Johnstown, Pa., has been connected with the organization for some time and at one time was assistant manager in the railroad division of the sales department of the Midvale Steel & Ordnance Co., Philadelphia.

Carl A. Wendell, for the past few years chief engineer of the American Ore Reclamation Co., New York, and formerly connected with the United States Steel Corp., has been retained by the General Briquetting Co., as consulting engineer with his offices at the company's headquarters, 25 Broad street, New York.

Howard W. Maxham has resigned as superintendent of automotive transportation with the American Bosch Magneto Corp., Springfield, Mass., to take charge of the maintenance department at the Amesbury, Mass., plant of Gray & Davis, Inc. His associates presented him with a gold watch and chain and a Masonic ring on his retirement.

Edward R. Stettinius has been elected president of the Foreign Commerce Corp. of America, succeeding Grayson M-P. Murphy, resigned, effective Feb. 1. Mr. Murphy is forming a new firm under the style of G. M-P. Murphy & Co., which will specialize in industrial companies, their financing and management, the formation of syndicates, etc.

H. Donald Dickinson, formerly superintendent of the West Penn Forge Co., Pittsburgh, has been made assistant superintendent of the Chester, Pa. works of the American Locomotive Works.

J. R. Marlow, manager of the Montreal branch of the Willys-Overland, Ltd., has been appointed secretary-treasurer of the company with general supervision of sales in the main office, Toronto. H. E. Brasier, service manager of the company, has been made Ontario sales manager and B. H. Caspey has been appointed service manager.

Charles K. Nichols, one of the founders of the West Penn Steel Co., Brackenridge, Pa., and who has been its general superintendent since that time, has been elected vice president to succeed the late John McGinley.

William P. Stout has been appointed district sales manager at Boston, for the Columbia Steel & Shafting Co., Pittsburgh, succeeding R. C. MacMillen, resigned. Mr. Stout was formerly district manager of sales at Philadelphia and has been succeeded at that point by Joseph J. Conlisk, formerly assistant district manager of sales at the company's Cleveland office.

Andrew G. Hill, president of the Malleable Iron Range Co., Beaver Dam, Wis., since 1902, retired from the office at the annual meeting in order to be relieved of the principal management responsibility. Fred W. Rogers, vice president, was advanced to president. His place is taken by Mr. Hill, John C. Zander, treasurer and Arthur S. Bowron, secretary, are continued in these offices.

C. W. Alexander has severed his connections with Robert Grant & Co., New York, and is organizing the partnership of Alexander & Taylor, Woolworth Building, New York, to deal in iron and steel. Mr. Alexander has been with Robert Grant & Co. for the past three years, handling the steel end of the business. The other partner of the new firm is W. S. Taylor, formerly with the Whitaker-Glessner Co., Wheeling, W. Va.

W. H. Underwood, for eight years in the sales department of the Domhoff & Joyce Co., pig iron and coke, at St. Louis and Chicago, being in charge of the latter office for the past two years, severed his connection effective Feb. 15. He will go to St. Louis to enter the sales organization of the St. Louis Coke & Chemical Co., producers of coke and pig iron at Granite City, Ill., with offices in the Boatmen's Bank building, St. Louis.

Men of the Machinery Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

LAWRENCE Wilkerson Wallace was elected secretary of American Engineering Council at the meeting of the executive board in Syracuse, N. Y., Feb. 14, succeeding L. P. Alford who has been acting secretary since the formation of the council in Washington on Nov. 19, 1920. Mr. Wallace has been one of the most active figures in the council and from the time it was organized has been its treasurer.

Born in Austin, Texas, Aug. 5, 1881, he was graduated from the Agricultural and Mechanical College of Texas in 1903 from when until 1906 he served with the Santa Fe railroad. He was a member of the Purdue university faculty during 1906-07, becoming head of the department of railway and industrial management. During this period Mr. Wallace conducted engineering researches.

At one time he was assistant general manager in charge of production of the Diamond Chain & Mfg. Co., Indianapolis. He is a director of the Red Cross Institute for the Blind in Baltimore; a member of the American Society of Mechanical Engineers and vice chairman of the society's management section; now in his third term as president of the Society of Industrial Engineers; past president of the Indiana Engineering society; and a member of the International Railway Fuel association, Western Railway club, Master Car Builders association, Academy of Political and Social Science and Western Efficiency societies.

Mr. Wallace now is at the temporary headquarters of the council in the Engineering Societies building, New York. He will soon transfer his activities to Washington, where the council has established headquarters in the McLachlen building.

B. H. Bristow, Draper Corp., Hopedale, Mass., has been elected a director of the Pilgrim Cotton Mills Corp., Fall River, Mass.

Frank B. Gilbreth, consulting engineer, Providence, R. I., is in England for the purpose of demonstrating his methods of motion-study analysis by means of moving pictures at the Efficiency Exhibition now being held at the Olympia Pavilion, London.

W. J. Murray has been elected general manager and H. H. Tamplin secretary-treasurer of the Troy Wagon Works Co., Troy, O. Mr. Tamplin succeeds G. R. Harris, who recently resigned.

Gilbert R. Jones, formerly with the E. & T. Fairbanks & Co., Inc., St. Johnsbury, Vt., has taken a position as manager of the caster and truck department of the Boston Equipment & Supply Co., Boston.

George Schlosser, vice president of the National India Rubber Co., Bristol, R. I., has been appointed by the receiver to have supervision of the manufacturing at the American Wringer Co., Woonsocket, R. I.

Arthur D. Little, chemical engineer and president of the Arthur D. Little Co., Inc., Boston, has been nominated for president of the alumni Association of Massachusetts Institute of Technology.

Charles W. McKay, as president and general manager, and P. C. Sherman, as vice president, have formed the partnership of McKay & Sherman, 741 Monadnock building, Chicago, valuation engineers.

Frank M. Bassett, sales manager for eastern Massachusetts of the Worcester Machine Screw Co., Worcester, Mass., and the Standard Screw Co. has established temporary quarters at 405 Main street, Worcester, the former offices having been destroyed by fire.

Judge James E. Cooper has been elected a vice president and J. B. Wilbor, Jr., assistant treasurer of the Stanley Works, New Britain, Conn. Mr. Wilbor was secretary of the Stanley Rule & Level Co., New Britain, when the Stanley Works purchased the company.

Charles L. Allen, president and general manager of the Norton Co., Worcester, Mass., and Henry D. Sharpe, president and treasurer of the Brown & Sharpe Mfg. Co., Providence, R. I., have been elected vice presidents of the Eastern States Agricultural and Industrial League, Springfield, Mass.

George J. Kirkgasser, advertising manager of the Cutler-Hammer Mfg. Co., Milwaukee, has organized George J. Kirkgasser & Co., 1734 First National Bank building, Chicago, advertising, publicity and merchandizing, with accounts for the Cutler-Hammer Mfg. Co., the Pawling & Harnischfeger Co., the Wetmore Reamer Co., and Frank D. Chase, Inc.

Howard W. Maxham, Chicopee, Mass., has resigned from the American Bosch Magneto Corp., Springfield, Mass., to become superintendent of Gray & Davis, Inc., Boston, a subsidiary.

George J. Blanton, for the past four years connected with the engineering sales department of the Chain Belt Co., Milwaukee, has been made New York district manager with headquarters at 50 Church street, New York. Prior to going with the Chain Belt Co., Mr. Blanton was eight years with the General Electric Co. in its plants at Schenectady, N. Y., and Milwaukee.

Alexander England, Wilkinsburg, Pa., who for eight years was assistant engineer of the Westinghouse Airbrake Co., has been appointed chief engineer, succeeding S. W. Dudley, who resigned Feb. 1 to accept a post as professor of mechanical engineering at Yale university. Mr. England has been connected with the Westinghouse company since 1908. Prior to that time he was affiliated with several manufacturing plants in Pittsburgh. His education was obtained in Scotland and England. He also spent several years in the Mediterranean and Black sea trade as an engineer for the Mercantile Marine Co., London, Eng.

L. E. Schumacher has been appointed superintendent of inspection and test of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Prior to going to the Westinghouse company, he was employed at the Niagara Falls Power Co. After completion of this company's plant, Mr. Schumacher entered the employ of the electric company, in 1900. His first position was in the switchboard construction department. He steadily advanced and in 1908 became chief inspector which position he held until 1918 when he was promoted to works manager of the Krantz Mfg. Co., Brooklyn, N. Y., a subsidiary of the Westinghouse Electric & Mfg. Co. This position he held until he returned to East Pittsburgh when he was appointed superintendent of inspection and test.

Fire Brick

Makers Operating Under 50 Per Cent—Mill Stocks Hold Out

Pittsburgh, Feb. 22.—Steel plants and blast furnaces are not taking sizable lots of refractories. Many of them stocked up well before the break came in the industrial situation and what ordinarily would be one or two months' requirements now is lasting three to six months. Consequently most of the new orders developing for the brick makers constitute repair items only and installations are small. A few orders are being received for between 10,000 and 14,000 each. Most of the kilns are operating on a basis of 30 to 50 per cent although some exceed that by at least 10 per cent. Some of the plants farther west are said to be operating full, due to an increased measure of demand in that localitly. One interesting order for new construction work recently received here called for 500,000 9-inch brick for a pottery oven. Some of the glass industries are doing considerable repair work and this keeps up the demand for fire clay as well as a special brick manufactured for that class of trade. Ladle brick demand is low although most of the stocks are said to be used up and shortly will have to be replaced.

Several propositions are up in the Pittsburgh district involving five to eight stokers which will require sizable lots of boiler setting brick as well as flat arches. Some magnesite brick has been reduced $10 per net ton and this now is quotable at $90 to $100. Chrome brick has been reduced slightly from $80 to $90, to $75 to $80.

Fire Clay Brick

(Per 1000 f.o.b. works)

Pennsylvania, No. 1	$40.00 to 50.00
Pennsylvania, No. 2	30.00 to 35.00
Ohio, No. 1	40.00 to 45.00
Ohio, No. 2	30.00 to 35.00
Illinois, No. 1	40.00 to 45.00
Illinois, No. 2	30.00 to 35.00
Kentucky, No. 1	40.00 to 45.00
Missouri, No. 1	37.50 to 42.50
Missouri, high grade	50.00 to 55.00
Maryland, No. 1	50.00 to 60.00
Maryland, No. 2	40.00 to 45.00

SILICA BRICK

Pennsylvania	$45.00 to 50.00
Chicago	55.00 to 60.00
Birmingham	50.00 to 55.00

MAGNESITE BRICK

(Per Net Ton)

9 x 4½ x 2½	$90.00 to 100.00

CHROME BRICK

(Per Net Ton)

9 x 4½ x 2½	$75.00 to 80.00

BAUXITE BRICK

(Per Net Ton)

55 per cent	$35.00 to 40.00
76 per cent	85.00, base

Uniform Accounting for Refractories Sought

At a meeting of the Refractories Manufacturers association held at Pittsburgh this week, the Refractories Accountants Institute was organized. Officers were elected as follows to serve until the first annual election, to be held in March: Chairman, W. J. Westphalen of the LaClede-Christy Clay Products Co., St. Louis; vice-chairman, A. Henderson of the Evans & Howard Fire Brick Co., St. Louis; and secretary C. W. Jordan of the Kier Fire Brick Co., Pittsburgh. This institute has for its objects the following:

1. To devise improved emthods as well as to introduce uniform principles of cost accounting to the end that everyone engaged in the refractory industry may accurately know the cost of his product.
2. To study the science of accounting in its entirety.
3. To make use of the common relationship of the plants which compose the Refractories Manufacturers' association and the common relationship between their executives to form like relations and benefits between those engaged in all phases of their accounting.
4. To promote acquaintance and sociability.

The necessity for organizing such an institute became apparent to the Refractories Manufacturers association because of the failure of its members to adopt a uniform cost system evolved by a New York firm of efficiency experts employed by the organization some time ago. The Refractories Manufacturers association has come to believe, not so much in a uniform cost accounting system, but to believe in the use by accountants of uniform cost fundamentals. To assure the adoption and use of such fundamentals, the accountants themselves have been asked to get together and formulate or devise such uniform cost principles as will apply to all of the fire brick plants. Only those directly connected with the accounting departments in the offices of the members of the Refractories Manufacturers association are eligible to membership in the Refractories Accountants Institute.

The annual meeting of the Refractories Manufacturers association will be held at the Pennsylvania hotel, New York City, March 17 and 18.

Acquires McKune Patents

The Miami Metals Co., 122 South Michigan avenue, Chicago, has acquired ownership of the McKune patents on an open-hearth process, which was fully described in THE IRON TRADE REVIEW of Jan. 6, 1921. It is granting licenses to open-hearth plants to operate under these patents. The Blaw-Knox Co., Pittsburgh, has been appointed exclusive agent for the manufacture and sale of the equipment.

Improved Demand

Shown For Benzol—Coal By-Product Prices Appear Firmer

New York, Feb. 22.—Demand for benzol has improved. In addition to the rubber interests, which have been in the market of late, there are also manufacturers of artificial leather, who, during the past week, have come in for fairly sizable quantities. Buying in toluol and solvent naphtha remains listless, and were it not for the production of motor fuel, for which there is a good demand, stocks of these materials would be heavy.

Prices appear slightly stronger, but are unchanged. Pure benzol is quoted at 30 to 36 cents per gallon, f.o.b. works; 90 per cent benzol, 29 to 34 cents; solvent naphtha, 29 to 34 cents; and toluol 30 to 36 cents. Naphthalene in flakes is quoted at 9 to 10 cents, and in balls, at 10 to 11 cents. These prices apply to both spot and future deliveries.

Shipments of naphthalene are now moving at a faster rate than at any time in recent weeks, deliveries on many of the contracts made last fall, now being due. The heavy shipments for delivery during the last half of this year, however, are expected to be made in April and May. Practically all current business in naphthalene is for second half delivery, and as yet this buying has not amounted to a large total.

Listlessness continues in the sulphate of ammonia market, there being no future buying and very little spot. Prices are holding nominally unchanged at $3.25, f.o.b. works.

Coke Oven By-Products

Spot

Per Gallon at Producers' Plants

Pure benzol	$0.30 to .36
Toluol	.30 to .36
Solvent naphtha	.29 to .34

Per Pound at Producers' Plants

Phenol	nominal
Naphthalene, flake	$0.09 to .10
Naphthalene, balls	.10 to .11

Per 100 Pounds at Producers' Plants

Sulphate of ammonia	$3.25

Contract

Pure benzol	$0.30 to .36
Toluol	.30 to .36
Solvent naphtha	.29 to .34

Per Pound at Producers' Plants

Phenol	nominal
Naphthalene, flake	$0.09 to .10
Naphthalene, balls	.10 to .11

Per 100 Pounds at Producers' Plants

Sulphate of ammonia	nominal

France Drops as Leading Buyer

Loses High Rank as Purchaser of Semifinished Material, Plates, Shapes, Sheets and Rails from United States—Colombia Displaced from Important Position in Barbed Wire and Dutch East Indies in Welded Pipe

CONDITIONS abroad which helped make 1920 the banner peace year in exports for the American iron and steel industry also brought some changes in the lineup of the countries which, based on their 1919 buying, had been listed among the half dozen leading purchasers of certain products of the industry. The changes occurred in seven of the nine products carried in THE IRON TRADE REVIEW's monthly study of exports by destinations, the seven being semifinished, including only ingots, blooms and billets: plates, structural shapes, sheets, rails, welded pipe and barbed wire.

Colombia's standing in barbed wire and that of the Dutch East Indies in welded pipe were the only positions as buyers affected other than France, which lost rank in the remaining five of the seven products in question.

In the buying of semifinished as listed, Japan, by taking 3554 tons in 1920, became a heavier buyer of this material than France. Earlier in the series of monthly comparisons, Belgium was listed by the government as a buyer of semifinished for the first time. Since then, however, Belgium's buying of this material here apparently has ceased and, instead, she is offering a surplus of her own product in England and other countries. The accompanying table shows the relative importance of the other leading countries as buyers of semifinished steel.

Holland's purchases of plates in this country last year amounted to 72,968 tons, displacing France's 27,407 tons and totaling 41,324 tons more than the tonnage shipped to Italy. Cuba, taking 4559 tons of black sheets, was the new buyer listed among the five leading consumers of this product.

India, carrying on extensive construction, took 39,840 tons last year, or 7520 tons more than Argentina, which received 82,320 tons.

Purchases totaling 37,719 tons placed the Dutch East Indies as one of the four principal buyers of American rails. This was an increase of approximately 12,000 tons over 1919. France again lost her position in this standing, dropping from the second largest buyer with 141,261 tons in 1919 to 11,950 tons.

Argentina and Canada each took more welded pipe in 1920 than the Dutch East Indies. Argentina was shipped 10,639 tons and Canada 10,227.

Australia last year became a large buyer of American barbed wire. Her purchases of 7010 tons removed Colombia, with 6867 tons, from the five leading buyers of this product.

Steel Exports to Principal Foreign Consumers

PIG IRON

	Belgium	Italy	United Kingdom	Canada	Japan	All countries
December, 1920..	....	421	2,444	5,446	....	10,055
December, 1919..	....	500	1,281	1,911	4,590	14,612
November, 1920..	300	1,994	844	6,733	....	13,920
November, 1919..	....	305	3,645	1,242	12,239	21,429
October, 1920....	642	301	4,324	8,544	....	17,296
October, 1919....	....	2,785	2,860	1,046	2,998	14,108
1920 to date.....	28,680	36,128	16,998	56,100	13,448	216,828
1919 to date.....	....	136,997	46,009	33,751	49,734	321,261

BLOOMS, BILLETS AND INGOTS

	Belgium	France	Italy	United Kingdom	Canada	All countries
December, 1920..	....	....	100	2,610	678	3,415
December, 1919..	....	....	7,514	9,901	423	21,538
November, 1920..	50	1	....	6,027	792	7,042
November, 1919..	....	360	197	11,054	292	13,211
October, 1920....	....	....	711	10,034	963	11,853
October, 1919....	....	4,366	3,794	11,892	257	20,713
1920 to date.....	42,455	3,015	21,100	132,643	8,478	216,873
1919 to date.....	....	77,275	50,524	105,075	10,225	258,424

STEEL PLATES

	France	Italy	United Kingdom	Canada	Japan	All countries
December, 1920..	4,887	5,093	18,444	23,393	4,570	114,547
December, 1919..	152	4,495	3,315	15,994	11,079	46,743
November, 1920..	3,609	1,189	17,363	21,728	3,433	79,420
November, 1919..	747	5,300	1,479	11,868	30,345	63,680
October, 1920....	1,659	9,241	21,624	16,750	2,250	91,087
October, 1919....	3,287	....	2,883	13,360	11,379	41,669
1920 to date.....	32,293	36,236	147,563	203,350	219,715	920,901
1919 to date.....	64,225	63,201	32,154	186,108	243,668	709,968

STRUCTURAL SHAPES

	France	Canada	Cuba	Argentina	Japan	All countries
December, 1920..	1,931	18,650	8,605	2,721	5,579	63,496
December, 1919..	339	5,433	2,721	675	1,399	15,610
November, 1920..	924	9,275	5,858	8,047	1,971	42,839
November, 1919..	2,752	4,952	3,204	1,919	2,675	22,939
October, 1920....	2,628	15,708	7,441	3,801	6,306	53,989
October, 1919....	6,091	6,255	3,748	1,513	2,079	26,641
1920 to date.....	13,872	137,930	47,703	32,320	89,839	493,655
1919 to date.....	79,665	99,032	23,600	13,265	49,920	360,787

BLACK SHEETS

	France	Canada	Argentina	Brazil	Japan	All countries
December, 1920..	402	6,717	2,391	926	1,009	17,729
December, 1919..	....	4,758	310	75	1,626	8,148
November, 1920..	383	5,787	2,741	521	1,807	16,063
November, 1919..	281	4,074	873	261	6,303	13,146
October, 1920....	155	7,206	1,435	398	3,182	17,128
October, 1919....	1,297	2,573	1,414	569	5,772	13,860
1920 to date.....	1,928	62,913	13,372	3,507	53,720	169,232
1919 to date.....	21,252	46,971	8,436	3,982	37,244	168,891

STEEL RAILS

	France	Cuba	Brazil	Japan	All countries
December, 1920.....	72	5,884	2,211	3,466	52,986
December, 1919.....	431	4,638	86	10,496	34,149
November, 1920.....	....	16,288	10,182	1,817	67,708
November, 1919.....	3,362	6,680	1,299	24,168	54,336
October, 1920.....	....	11,983	6,518	4,745	53,266
October, 1919.....	1,726	6,454	2,750	13,505	43,730
1920 to date.....	11,950	114,371	50,982	135,873	594,634
1919 to date.....	141,261	57,281	8,816	152,997	652,443

TIN PLATE

	Canada	Brazil	China	Hongkong	Japan	All countries
December, 1920..	4,412	2,581	2,387	173	1,898	20,943
December, 1919..	3,946	510	1,504	309	5,732	15,372
November, 1920..	3,426	1,427	3,469	144	951	15,423
November, 1919..	4,332	679	1,937	230	9,059	18,934
October, 1920....	5,989	1,484	4,322	159	1,438	20,287
October, 1919....	2,910	1,049	268	300	4,816	11,938
1920 to date.....	63,086	22,057	19,462	7,276	49,753	226,396
1919 to date.....	41,198	14,062	16,949	7,898	45,460	204,508

WELDED PIPE

	Mexico	Cuba	British India	Dutch E. Indies	Japan	All countries
December, 1920..	15,620	2,593	2,808	1,277	992	39,636
December, 1919..	2,767	936	1,524	358	1,377	11,602
November, 1920..	10,238	2,338	1,444	2,370	432	25,315
November, 1919..	2,747	937	1,132	371	2,723	15,151
October, 1920....	9,895	2,179	2,014	721	1,332	24,537
October, 1919....	3,314	1,412	2,045	2,423	1,752	17,489
1920 to date.....	97,385	22,576	23,166	8,065	29,614	284,754
1919 to date.....	47,478	10,505	27,496	19,199	25,859	236,065

BARBED WIRE

Period	Canada	Cuba	Argentina	Brazil	Colombia	All countries
December, 1920..	1,052	481	2,505	3,438	567	13,930
December, 1919..	1,923	1,621	1,461	2,446	624	10,138
November, 1920..	3,141	1,295	3,915	3,341	309	15,507
November, 1919..	803	1,958	1,943	1,802	615	8,665
October, 1920....	1,441	2,503	1,669	2,986	452	13,654
October, 1919....	923	1,811	1,751	4,099	672	11,710
1920 to date.....	21,952	12,541	19,413	32,236	6,867	129,702
1919 to date.....	22,135	13,237	12,935	26,236	5,244	101,445

To Open Car Plant

In Birmingham District—Some Works Resume—Appoints Tariff Council

Atlanta, Ga., Feb. 22.—Officials of the Chickasaw Shipbuilding & Car Co., Birmingham, Ala., have announced that the company's new pressed steel car plant now being constructed at Fairfield will probably be completed and ready for operation about May 1. The Louisville & Nashville railroad has placed an order with the new plant for 2700 cars. Maximum capacity will be 25 completed cars daily.

The Knoxville Iron Co., Knoxville, Tenn., has resumed operations and is working 24 hours a day after being shut down for a period of several weeks. Edward D. Attix, assistant general manager, stated the outlook is better than for several months and that business is being received in sufficient quantity to insure continued operation on the schedule adopted.

Operations are expected to begin within 30 days at the new plant of the International Harvester Co., now under construction at Chattanooga, Tenn. The company sometime ago acquired the plant of the Chattanooga Plow Co., and this plant is being greatly enlarged. An additional plant is also being constructed in Chattanooga.

The Unit Stove & Range Co., of Birmingham, which a year ago constructed a large stove works near the by-product coke plant of the Sloss-Sheffield Co., is installing complete equipment and is preparing to manufacture hot air furnaces.

The Ideal Tractor Cultivator Co. has been organized and incorporated at Memphis, Tenn., with $1,000,000 capital, to establish a plant for the manufacture of a tractor invented recently by R. L. Tolston, Memphis. The factory will be a part of the North Memphis Machine Works where production will be started immediately. R. F. Carr is president of the new corporation.

Hollis M. Caldwell, Cahill Iron Works, Chattanooga, Tenn., has announced that the new plant of the Mutual Enameling Co., now under construction in Chattanooga, will be completed and probably ready to operate by July 1. The foundry, cleaning room and machine shops are now being constructed.

In accordance with action taken at the recent convention of the Southern Tariff association, John H. Kirby, Houston, Tex., president of the organization, has announced the appointment of a board of governors for the Atlanta Tariff Council to carry on the work in Atlanta territory. The attempt to establish a protective tariff on all southern products will be furthered through their efforts. Membership of these councils will primarily include manufacturers representing the various fields of industry. The Atlanta council, which is the first, to be formed, has 23 members, which include: J. Russell Porter, Thomas K. Glenn, Atlantic Steel Co.; B. Mifflin Hood, Georgia Brick & Tile Co.; Charles Krueger, Krueger Mfg. Co.; J. F. Dickinson, of the Southern Belting Co.; J. W. Leroux, of the Virginia Bridge & Iron Co.; J. W. Rawlings, B. F. Avery & Sons, and J. W. Yopp, secretary, Georgia Manufacturers' association.

For the first time in 53 years the furnaces of the Roane Iron Co., at Rockwood, Tenn., have been closed down because of the general depression in the iron market. The furnace will remain idle for about two months to make repairs and improvements to the company's properties.

Mica experts and mining engineers have begun operations for the extraction of mica on properties near Rockford, Ala., three shafts have been sunk and three veins of mica lying close together discovered. Outcroppings show over a 5-mile stretch. The mica was found to be at an average depth of 8 feet.

Canadian Merger

Plans Narrowed to Three Companies —Dominion News

Toronto, Ont., Feb. 22.—A further step in the direction of bringing to a conclusion the long delayed merger of steel and other interests under the name of the British Empire Steel Corp., is expected to be taken at a meeting of the directors of the Nova Scotia Steel & Coal Co. to be held in Montreal, and it is probable that definite information on the subject will be given out before the end of the present month. The Dominion Steel Corp., also will hold a meeting in Montreal, with this end in view. It is understood that the plans as modified will be submitted to the full board of the Nova Scotia Steel & Coal Co., after having been under the consideration of the executives for some time. In a general way it is understood the only change in the original plan is the dropping of the Maritime Nail Works, Ltd., of St. John, N. B. This brings the merger down to the Dominion Steel Corp., the Nova Scotia Steel & Coal Co., and the Halifax Shipyards, Ltd.

The Canadian parliament began what is expected to be a stormy session on Feb. 14. The speech of the governor general outlinging the policy of the government announced that in accordance with the findings of the tariff investigation committee a revision of the tariff will be undertaken within the near future.

According to estimates placed before the provincial assembly, the capital expenditure of the Hydro Electric Power commission of Ontario, for the current year will amount to $29,347,700.

Figures recently compiled show that Canada's foreign trade for 1920 totaled $2,639,726,135, of which $1,336,921,021 was represented by imports and $1,302,805,114 by exports. The figures show an increase of nearly $400,000,000 in imports over 1919 and an increase of about $8,000,000 in exports over the corresponding period of 1919. An increase of approximately $30,000,000 is shown for 1920 over 1919 in the export of purely Canadian goods. There is a decrease of some $23,000,000 in the export of foreign goods from Canada.

The greatest amount of imports came from the United Kingdom and the United States. From the former there was imported $231,479,294 worth of products and from the United States $921,625,825. In 1919 only $87,659,198 worth of goods were brought in from the British Isles. Export trade with the United Kingdom shows a reduction from $528,036,604 to $341,168,451. Export trade to the United States shows an increase from $454,595,204 in 1919 to $559,956,669 in 1920.

It is reported that the Canadian Pacific Railway Co. is negotiating for control of the Granby Mining, Smelting & Power Co., one of the largest copper producing companies in Vancouver, operating mines and a smelting plant at Anyox and also working extensive coal fields on Vancouver island.

The report of operations of subsidiaries of the Lake Superior Corp., for six months ending Dec. 31 shows there was a substantial increase in output. Shipments of iron and steel by the Algoma Steel Corp., Ltd., Sault Ste. Marie, Ont., totalled 244,991 tons as compared with 140,954 in the last six months of 1919. Production for the last six months of 1920 was as follows: Ore from the Magpie mine, 83,387 tons; coke, 269,385 tons; pig iron, 233,332 tons; and steel ingots, 190,052 tons. Unfilled orders for iron and steel on Dec. 31 were for approximately 69,500 tons. The company states that two contracts have been closed for rails for delivery during the first half of 1921.

Protest High Tariff on Ferromanganese

Washington, Feb. 22.—Protests against the proposed duty of $44.80 per ton on ferromanganese are reaching the finance committee of the senate. C. W. Leavitt & Co., New York, brokers in ores, metals and alloys set forth the objections in the following letter:

"The average selling price of ferromanganese in this country during the period 1908 to 1914 inclusive was only about $47 per ton, and therefore, a protection of $44.80 per ton would be a severe penalty to inflict.

"The Steel corporation produces its own ferromanganese, and the independent manufacturers of steel would thus be placed at a serious disadvantage with the corporation, and this tremendous duty would also tend to prohibit the exportation of steel by the independent producers.

"Under the tariff act of 1897 ferromanganese was assessed $4 per ton and under the act of 1909, it was assessed $2.50 per ton, and the present ocean freight and insurance on the European shipments gives the American producers an additional protection of about $4 per ton.

"It may be advisable to place a duty not exceeding the rate given in the tariff act of 1897, but even in that event the American manufacturers should be compelled to show by sworn statements if their cost of production is greater than the foreign cost, after making due allowance for the ocean freight and other charges."

Plans New Steel Works On Pacific Coast

Plans are under way for the erection of a steel works at Sacramento, Cal., by the United States Electric Steel Products Co., Inc., San Francisco. These plans call ultimately for the erection of blast furnaces, open-hearth furnaces, electric furnaces and rolling mills. The project embraces the acquirement of large deposits of high grade magnesite, a large acreage of coking coal and valuable water power locations.

The United States Electric Steel Products Co., was recently organized with A. P. Gilles, Lindsay Duncan, formerly of the Guggenheim-Jackling interests, and F. L. Firebaugh, formerly in the government service, as engineers in charge. A 200-acre tract adjoining the shops of the Southern Pacific railroad has been selected as the plant site. The output of the first unit, work on which is expected to be started shortly, will be exported it is announced. It is hoped eventually to produce pig iron, at, square and round merchant bars; structural steel; concrete reinforcing bars; steel tubing; sheets; plates and castings and high grade alloy steels from electric furnaces.

Export Managers to Meet

The National Federation of Export Managers will meet at the Hotel Pennsylvania, New York, March 7, to form a national organization of export associations. The movement is indorsed by the Export Managers club of New York, which has several committees investigating the problems now facing exporters. The annual dinner will be followed by an address by the former secretary of commerce, William C. Redfield, on "What I Expect from Our Export Department."

Obituaries

AUGUSTUS J. H. Renshaw died Thursday, Feb. 17, at his home in Terre Haute, Ind. For a time he was connected with the old Wabash rolling mill, and in 1888 went to Brazil to take charge of a mill. Later he returned to Terre Haute and purchased the DeBaun mill, retiring from this business some time ago on account of failing health. He was 69 years old and was born in Portsmouth, O.

Thomas Griffin, manufacturer of stoves and piano plates, died at his home in Guelph, Ont., recently, after a short illness. He was 65 years old.

Jacob Gottfried Braun, aged 64 years, died Feb. 12 at his home in Chicago. For more than 30 years he was an importer and manufacturer of iron and steel in Chicago.

Herbert Field, treasurer of the Congdon & Carpenter Co., Providence, R. I., iron, steel and metals, died at his home in that city, recently, aged 64 years.

Guy S. Sperry, president of the Geneva Foundry & Machine Co., Geneva, Ill., died Feb. 13 at his home in Batavia, Ill., of heart disease after an illness of less than an hour. He had built up the business of his company from a small beginning.

Charles B. Schoenmehl, inventor and formerly connected with the tube department of the American Brass Co., Waterbury, Conn., died unexpectedly at his home in that city, Feb. 14. In recent years he had been in business for himself and was president and treasurer of the Waterbury Battery Co., and of Charles B. Schoemehl, Inc.

Adelbert P. Hine, for many years general superintendent of the Waterbury, Conn., branches of the American Brass Co., died at his home in Woodbury, Conn., Feb. 16, aged 69 years. He was one of the pioneers in the brass industry in that section of the country and for over 40 years was connected with the American Brass Co. He retired from active business life in 1913.

Everett S. Eddy, for more than 20 years salesman in New England territory for the Howard Bros. Mfg. Co., Worcester, Mass., wire heddles, died in a hospital in Burlington, Vt., Feb. 15, as the result of a fractured skull received in an automobile accident in that city, Feb. 9. He was 44 years of age. Before going to the Howard Bros. Mfg. Co. he was employed by the Washburn & Moen Mfg. Co., now part of the American Steel & Wire Co.

Andrew J. Pierce, a pioneer designer and manufacturer of internal combustion engines, for many years a resident of Racine, Wis., died at his home in Chicago recently, aged 62 years. In 1893 he organized the Pierce Engine Co., Racine, manufacturing gasoline engines, marine motors, launches, etc. Two years afterward the manufacture of automobiles was undertaken the company being one of the earliest in this field. The J. I. Case Threshing Machine Co. purchased the plant and business in 1911, adding it to a passenger car manufacturing division.

Edward B. Hatch, president of the Johns-Pratt Co., Hartford, Conn., maker of insulating materials, died unexpectedly at his home in that city Feb. 18, aged 60 years. From a clerkship he rose to be executive head of the company as well as one of the prominent manufacturers of the state. He was a director of the Hart & Hegeman Mfg. Co., the Bush Mfg. Co., and the Jewel Belting Co., all of Hartford, and the Holyoke Water Power Co., Holyoke, Mass. He also was vice president of the Electrical Manufacturers club. In 1919 he was president of the Hartford Manufacturers association.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

ESTABLISHED in 1878 by William H. Frost and Charles Jones, with a capital stock of $2500, the Smith's Falls Malleable Castings Co., Ltd., Smith's Falls, Ont., recently was re-incorporated as the Smith's Falls Malleable Castings, Ltd., with an authorized capital stock of $750,000. Shortly after the original company was started in 1878, Mr. Jones, one of the owners, sold out to Mr. Frost, his partner, who with J. Edwin Frost, carried the business on under the name of the Smith's Falls Malleable Iron Works, until 1903, when it was reorganized. In 1906 the company absorbed the plant and business of the Rideau Malleable & Foundry Co., Ltd., increasing its capacity 3000 tons annually. Since the company's original incorporation in 1903 it has operated on a capital stock of $150,000, but with the rising cost of manufacture, it has found this amount inadequate. At present it is contemplating doubling the capacity of its No. 2 plant, and has made provision in its charter for the manufacture of steel castings. It will install an up-to-date machine shop. Officers of the company are: President and general manager, George B. Frost; vice president and treasurer, Dr. C. A. Patterson; secretary and sales manager, J. E. Frost. The company is the second oldest among the manufacturers of malleable castings in Canada.

* * *

GILBERT & Barger Mfg. Co., Springfield, Mass., has denied a rumor it was planning to erect a new plant at St. Louis, but has advised that in order to improve the distribution of its products it has taken on a warehouse at St. Louis.

* * *

PLANS are under consideration by the Peden Iron & Steel Co., Houston, Tex., for the erection of plant buildings at its Ft. Worth, Tex., properties, but it will be some time before the company will be ready to announce its plans.

* * *

ADVICES have been received from the J. Garnett Starr Co., Inc., Atlanta, Ga., to the effect it acts as purchasing agent for a large number of Cuban hardware and mill supply houses, and besides its home office maintains an office at Havana, Cuba.

* * *

THE Marion Fence Machinery Co., Marion, Ind., which was recently incorporated with a capital stock of $75,000, has advised it has purchased a plant which will be devoted to the manufacture of farm fencing, etc. It recently purchased complete equipment for the building.

* * *

CAPITALIZATION of the Schlangen Bros. Co., Chicago, manufacturer of brass goods, recently increased its capital stock from $50,000 to $100,000 and elected the following officers: President, N. A. Schlangen; treasurer, Carl Schlangen and secretary, E. C. Roos.

* * *

THE recent increase in the capital stock of the Burton Auto Spring Mfg. Co., Chicago, from $100,000 to $200,000, was made in order to finance the rapidly enlarging business of the company. At present it is planning to enlarge its plant and put in more machinery, tools and equipment.

* * *

ELECTRIFICATION of one of its plants is now under way by the Pacific Lumber Co., Scotia, Cal. This consists of the installation of a 2000-kilowatt turbo-generator and the necessary switchboards and other apparatus. Contracts for all this equipment have been let.

* * *

TWO parcels of land aggregating 80,000 square feet have been purchased by the Standard Sanitary Mfg. Co., Pittsburgh, for future expansion. This property at Ontario street and the Ohio river in Pittsburgh, adjoins the company's present site and covers requirements for a large increase in its capacity.

* * *

ADVICES have been received from the Allen Iron & Steel Co., Philadelphia, to the effect the recent increase in its capital stock, from $50,000 to $100,000, was not made to cover extensions and plant enlargements, but was merely the capitalization surplus which has been growing steadily since the company's incorporation.

* * *

ADVICES have been received from the Hodges Stucco Machine Works, Cincinnati, to the effect it now has its own manufacturing plant and is in a position to ship its product from stock. The company was recently reorganized and officers now are: President, J. T. Rowell and secretary-treasurer, W. H. Morris.

* * *

REORGANIZATION of the Pyramid Grate Bar Co., Inc., New York, has been effected and the company is now known as the Pyramid Iron Products Corp. No change in personnel has been made. The company operates two foundries at Yonkers, N. Y. Officers are: President, O. S. Ironmonger; vice president, Frank Kingsland and secretary and treasurer, G. W. Elder Jr.

* * *

HOUSEHOLD tools, etc., are the products of the Easiway Cleaning Co., 405 Courtland street, Baltimore, which was recently incorporated with $20,000. The company already has a plant in operation but shortly contemplates expansion, and advises it will need punch presses, wire benders, knitting machines, etc. Officers are: President, M. W. Hill; vice president, J. A. O. Tucker and secretary, M. L. Hill.

* * *

AT THE recent annual meeting of The Allegheny Steel & Tube Co., New York, the following officers were elected: Chairman, Louis Kilian, T. L. Dodd, W. T. Dunn, John Benjes, J. W. Wood, Bernard Hoersgen and Henry Latshaw. The following officers were also elected at the meeting: President, Noble W. Wood; vice president, T. L. Dodd; vice president, W. T. Dunn; vice president, Bernard Hoersgen; treasurer, John Benjes; secretary, Henry Latshaw and assistant secretary, C. Gottesman. Theodore L. Dodd, western sales manager of the Worth Steel Co. and William T. Dunn, formerly general manager and director of the International High Speed Steel Co., succeeded J. R. Martin and C. Gottesman on the board of directors.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

IN ORDER to finance the expansion of its business the New Haven Sherardizing Co., Hartford, Conn., recently increased its capital stock from $50,000 to $150,000. A large part of the capital increase will be used in the expansion of the company's products which consist of mandrels for the rubber trade, both straight and curved, but the majority of the new stock will be used in the development of the company's grinding machine which is known as the Connecticut Universal Grinding machine and is manufactured by the Middlesex Machine Co., Middletown, Conn. This machine, with all patents, etc., now is controlled by the New Haven Sherardizing Co., and it is the company's plan to expand in this particular department, but to apply the grinding machines for tubular and standard drill rods. It is the intention of the company to erect additional buildings and it will be in the market for electrical and other power equipment, as well as machinery and general machine equipment.

* * *

ADVICES have been received from the Taunton Castings Co., Taunton, Mass., to the effect it has been incorporated with a capital stock of $25,000. It expects later on to build a new foundry building, but at present it is occupying the Tremont street plant of the White-Warner Co. Officers of the company are: President: J. P. McKenna; general manager, Elmar Owran and treasurer, Wilbur E. Forbes.

* * *

CAPITALIZED at $75,000, the Marion Metallic Vault Co., Marion, O., recently was incorporated and will engage in the manufacture of three distinct types of grave vaults. The company plans to erect a plant which will be equipped with electric welding apparatus, rolls, etc. Officers are: President, B. F. Waples; vice president, C. F. Werley and secretary-treasurer, Jay H. Maish.

* * *

LOUIS J. Lind has organized the Carlen Engineering Co. with general offices in the Keystone building, Pittsburgh, for the sale of reinforcing steel, including reinforcing concrete bars and fireproofing materials. Mr. Lind is president of the company, William G. Watt is secretary and F. Kubitz is chief engineer. An engineering department is maintained to co-operate in the solution of engineering problems.

* * *

WORD has been received from the Jackson Metal Products Co., Jackson, Mich., to the effect it recently completed the erection of an addition to its plant, which doubles its former capacity. The company has been gradually installing new equipment, for the manufacture of metal automobile accessories, but at the present time it is not in the market for any additional machinery or tools.

* * *

BINDER twine and rope machinery will be manufactured by the Watson Bros. Machine Co., Bound Brook, N. J., which was recently incorporated and has taken over the business established in January, 1920, by Robert F. Watson and Charles F. Watson. The company has a modern 1-story factory building, which is completely equipped. It is not at this time in the market for additional equipment.

* * *

ADVICES have been received to the effect the George J. Kelly, Inc., Lynn, Mass., which was recently noted as incorporated, is the successor to the George J. Kelly Co., manufacturer of shoe polishes at Lynn, Mass., and gas lighters and other metal goods at Haverhill, Mass. The new organization is capitalized at $275,000 and officers are: President, George J. Kelly; treasurer, E. Russell Moulton and secretary, Robert A. Pritchard.

* * *

N. B. PAYNE & CO., 25 Church street, New York, dealers in electric cranes and hoists, have extended their lines of material handling equipment to include the portable conveyor of the A. C. Warner Co., Philadelphia; also the coal elevator of the Chicago Conveyor Co., Chicago, and the piler and car loader of the McKinney-Harrington Co., also of Chicago. Edmund Otto, for several years secretary of the Hardware & Supply Co., New York City, and prior to that associated with Manning, Maxwell & Moore, Inc. also of that city, is now associated with the Payne company, in this branch of the business.

* * *

ORGANIZED with $5000 capital stock, the Paragon Power Specialties Co., Hartford, Conn., will manufacture and sell hand hole scrapers and steam specialties. The company advises it does not plan to erect a plant at present, as it has contracted outside for the production of its products, and therefore it is not in the market for equipment. The executive officer of the company is H. C. Bailey, room 310, 18 Asylum street, Hartford, Conn.

* * *

WORK has been started on the construction of addition to the plant at Dallas, Tex., of the National Casket Co. The improvements will cost in the neighborhood of $100,000, and will include a brick and reinforced concrete power plant, a lumber kiln, a lumber storage house and a warehouse building. The improvements will cover a tract, 200 x 200 feet, immediately adjoining the present structure. When completed the company will manufacture wooden, metal caskets, etc.

* * *

COMBINATION locks will be manufactured by the Triple Metals Corp., Waukegan, Ill., which was recently incorporated with a $100,00 capital stock. The company is planning to build a plant in the future, but for the present its quarters are adquate. Officers are: President, George D. Full; vice president and treasurer, John K. Selleck and secretary, H. E. Martin. The company is closely connected with the Steen Combination Lock Co., with which it may shortly be merged.

* * *

SINCE Feb. 1 the business of the Pittsburgh Shafting Co. of Detroit, has been conducted as a branch of the Columbia Steel & Shafting Co., Pittsburgh. Wendelin C. Schrags, who was president and treasurer of the Pittsburgh Shafting Co., of Detroit, now is treasurer of the Columbia Steel & Shafting Co. with headquarters at Pittsburgh. Thomas H. Booth, formerly vice president and general sales manager of the Detroit company, has been made district manager of sales of the Columbia company at Detroit.

Machine Tool Demand Is Small

Sizable Business Is Lacking, Inquiries and Orders Being for Single Machines—Prices Leading Topic Between Buyer and Seller—Crane Business Slack Though January Orders Show An Increase

MACHINE tool and equipment business done during the past week has been of small proportions.

A number of new inquiries came out, but none were of size and sales were principally of single machines. Price continues the outstanding topic among buyers and sellers. Prices here and there continue to fall, and in addition it is known many dealers are granting concessions where buyers ask them. During the past few days the Landis Tool Co., Waynesboro, Pa., announced a 15 to 20 per cent reduction. That the matter of price is paramount in the minds of tool buyers, is indicated by the fact the Santa Fe railroad closed on considerable equipment recently, only after tool manufacturers met its idea of price.

Although general trading is slack, reports from various districts indicate that to some extent business is better. Inquiries and orders received are in greater volume than has been the rule for some time.

The meeting of the National Machine Tool Builders' association in Cleveland, scheduled for the latter part of this week, is looked forward to with considerable interest because of the trade sentiment that will be displayed.

Automotive demand continues light despite reports of renewed activity. The railroads also continue out of the market. No real buying movement is expected for months. One of the few inquiries of size reported during the week is that of The Greiner-Semon-Lowry Co., Syracuse, N. Y., which asked for estimates on aproximately $60,000 of tools.

Crane business is dull. A few new inquiries are current, both for overhead electric and locomotive cranes, but as a rule orders are few and far between. During the month of January it is estimated the orders received by manufacturers of overhead electric traveling cranes showed an increase of approximately 70 per cent as compared with figures for the preceding month. It is also estimated that at the present rate of production, manufacturers are sold ahead for more than three months.

Eastern Tool Buyers Continue Out of Market

NEW YORK, Feb. 22.—Although few sizable lists are before the local machine tool market, small inquiries are coming out more freely. In some quarters this is resulting in better buying. One seller within the past week booked six machines for as many buyers, which was more than he had sold in the three weeks preceding. No large orders are reported.

One of the few sizable inquiries to be reported recently in this district is that of the Greiner-Semon-Lowry Co., Syracuse, N. Y., involving approximately $60,000 of miscellaneous machine tools.

Overhead crane buying is confined to few orders. The Semet-Solvay Process Co., Syracuse, N. Y., has made a formal award of two 5-ton, 4-motor grab bucket cranes, with spans of 50 and 80 feet, respectively, to the Pawling & Harnischfeger Co., Milwaukee. The cranes are for installation in the plant of the Cambria Steel Co., Johnstown, Pa., and had been reported as informally placed a fortnight ago. The St. Regis Paper Co., Albany, N. Y., also placed an order with the Pawling company for a 5-ton electric crane, with 32-foot span. The Hoosier Rolling Mill Co., Terre Haute, Ind., awarded three cranes to the Champion Engineering Co., Kenton, O. Two are of 10 tons capacity, with spans of 67 and 80 feet respectively, and the third is of 5 tons capacity, with a span of 83 feet. The Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., received orders in the eastern district for two small overhead cranes.

Outstanding among new inquiries reported at this time is one from the Worthington Pump & Machinery Co., Harrison, N. J., involving one 5-ton electric overhead crane with 58-foot span, one special type gantry crane, and two underhung 1-ton handpower cranes, with spans of 9 and 13 feet, respectively. The cranes are for installation at the company's Cambridge, Mass., works. The M. W. Kellogg Co., Jersey City, N. J., has revised and enlarged its inquiry so as to include two 40-ton, four 20-ton and one 5-ton electric cranes and two handpower cranes, of 5 and 10-tons capacity.

While inquiries are fairly numerous in the locomotive crane market, orders are slow in coming through. In some quarters there is optimism regarding possible railroad buying, there being more interest shown on certain propositions which have long been standing.

Locomotive cranes are to be purchased by the Union Tank Car Line Co., 21 East Fortieth street, for its proposed plant at Lima, O. The Empire State Steel Products Co., 233 Broadway, is inquiring for a locomotive crane, to be equipped with a magnet, and J. Goldenburg, Jersey City, N. J., wants a new or used crane. Orders for locomotive cranes include a 20-ton Browning crane for the Briddell Co., Baltimore, and a 40-ton Industrial crane for the Czarnikow Rionda Co., 112 Wall street, for shipment to Cuba. The Standard Shipbuilding Co., Shooters island, N. Y., has sold a 15-ton American, a 15-ton Ohio and a 20-ton Ohio locomotive crane to Philip T. King, 30 Church, contracting engineer.

While demand for foundry equipment is spotty and light some improvement is shown. Sellers report this is especially true with regard to flasks and various sundry supplies. Buying of the larger equipment, however, is lacking. The Ramapo Car Wheel & Foundry Co., Ramapo, N. Y., recently purchased a cupola from the Whiting Corp., Harvey, Ill., and the Lunkenheimer Co., Cincinnati, placed

LUDLUM
SPECIAL STEELS
LUDLUM STEEL COMPANY

STEELS
SPECIAL PURPOSES
WATERVLIET-N.Y-U.S.A.

Iroquois Special

"One Fire, One Pipe, One War Club" was Hiawatha's counsel leading to the formation of the invincible Iroquois, the League of Five Nations, whose members were known in the early days in every village east of the Mississippi for the keen, merciless edge of their scalping knives.

Today ***Iroquois Special,*** the well known, modern, fast finishing steel, is equally renowned and respected, both east and west of the Mississippi for the keen, hard edge it carries and keeps when turning chilled rolls, drilling, reaming gun barrels, and when used for engraving tools and for circular forming tools for automatic machines.

No matter what your requirement, there's a Ludlum Tool Steel that will reduce your costs.

Ludlum Steel Company

General Offices and Works

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"Masters of the Industry"

Branch Offices:

Chicago Pittsburgh Buffalo
Cleveland Philadelphia Cambridge, Mass.
San Francisco New York City

Be sure you have your copy of our textbook. It's free.

about $25,000 worth of sand blast machinery and apparatus.

Tool Sales Fall Off

BOSTON, Feb. 22.—Recent sales of machine tools in New England have not kept up with the pace set a week or 10 days ago and an increasing number of dealers report a falling off in orders. Buyers are p'acing more and more stress upon price and in several individual sales have switched from one make to another in order to save from $100 to $200 on $1500 to $2000 machines. With this tendency to shop around with price as the decided feature, used equipment is being kept in the limelight. Seldom has the New England market been as flooded with second-hand tools as it is today. Auction sales are taking place at one point or another almost every week. One sale at Springfield during the past week was the means of some excellent equipment changing hands at relatively low figures. During the coming week the Wilton Tool & Mfg. Co.'s complete stocks of tools will be sold at auction in Boston. The list includes several hundred tools of standard make, and already is developing considerable local interest and effecting, at least temporarily, the sales of new equipment. Inquiry shows some improvement, but dealers have estimated so many times on prospective orders which never materialized that they are reluctant to place much hope on the greater volume of requests for figures.

A New Bedford company which some time ago came into the market for approximately 30 tools has revised its list and now is said to be actively asking for 10 to 12 tools. A Rhode Island mill is asking for a lathe and one other machine tool and other users scattered throughout the eastern part of New England are in the market for an aggregate of 8 or 10 tools. Textile mills have been rapidly increasing operations and it is this branch of industry that is furnishing a large percentage of the tool inquiry. The railroad repair shops are also busy and several recent inquiries have originated from this source. During the week a Rhode Island mill bought a lathe at about $1100 and several other small sales were made.

Break in Prices is Seen

CHICAGO, Feb. 22.—Signs indicate a general readjustment of prices of machine tool equipment is about to be made. Heretofore manufacturers have stood firmly for present quotations and have resisted concessions in the belief they would not stimulate buying. Buyers who are in need of equipment apparently have been on strike and cannot be persuaded to change their stand by any other means than lower figures. The change is the result of the position taken by the Santa Fe railroad, which has had a large list before the trade for several weeks and which within the past 10 days has made it plain that it is ready to buy only on conditions that prices are made right. Inasmuch as this road apparently has sufficient money for all needs, sellers of machine tools have become interested in the possibility of taking this business immediately and have made concessions ranging from 10 to 15 per cent.

The Santa Fe list has been cut down considerably from the first inquiry, practically all planers being withdrawn while three boring mills, numerous turret lathes and other machines have been removed from the list. In the case of some other items buying has been deferred and will be taken up later. In the latter class the numerous machines on which manufacturers would not make concessions. The position of the road was that 10 to 15 per cent below prevailing quotations would be the only factor that would bring about buying at present. A boring mill manufacturer will announce a reduction of 10 per cent in prices effective March 1. This cut was offered the Santa Fe railroad for immediate use.

General buying is as slack as ever. Users are in a passive mood and are not even willing to place orders for equipment they need. An instance happened recently where a number of machines were desired but it was made plain by the buyer that lower prices must be made. A trade basis finally was arranged whereby an equal number of old machines was taken at an exchange value which made the new machines cost about two-thirds the list price. This negotiation was refused by the buyer as not sufficient and the manufacturer then made a further concession, bringing the total discount to almost 40 per cent.

Buyers Look for Lower Prices

PITTSBURGH, Feb. 22.—Disinclination to buy among users of machine tools is said to be founded upon a feeling that tool prices have not touched bottom. On certain makes of machines prices are being guaranteed against declines until July 1, but slight concessions are being offered here and there in order to book business. Inquiries are fairly numerous but these do not rapidly turn into orders. Orders for the most part represent absolute needs and where replacement tools are under consideration the tendency is to defer closing as long as possible. While most of the inquiries current involve one machine only, a few of larger proportions continue to be received from time to time and typical of this is the list issued by a coal company in Charleston, W. Va. This calls for four motor-driven machines including a hammer, lathe, floor grinder and drill press. The Carnegie Steel Co. so far as reported has not closed on equipment for its locomotive shop at the Edgar Thomson works, Braddock, Pa., for which several machines are required. The American Sheet & Tin Plate Co. likewise has postponed buying.

Hoists are in more popular demand than are cranes at the present time. Several inquiries are current but only occasionally is an order received. The J. W. Cruikshank Engineering Co., this city, bought a 1-ton hoist for one of its blast furnace clients. Lack of expansion explains the sustained absence of crane buying. Several propositions still are before sellers including the Pittsburgh Screw & Bolt Co., which wants several cranes and hoists; the plant of the International Nickel Co., at Huntington, W. Va., will be equipped with cranes.

Market is Featureless

CLEVELAND, Feb. 22.—Demand for machine tools and equipment continues of small volume in this district. Orders and inquiries are for single machines and most dealers report even a falling off in this class of business, as compared with other weeks. No large purchases were made during the week and no inquiries of size are current. To some extent a pickup in machinery sales is not expected by many dealers for a number of months. Considerable interest is centered on the convention in Cleveland this week of the National Machine Tool Builders' association. It is thought price reductions will be one of the leading topics of the 2-day meeting, which has been advanced from May.

Price reductions continue to be made, although it seems that the recent wave of such readjustments is less in evidence, at least for the present. During the past few days, the Landis Tool Co., Waynesboro, Pa., has put into effect a general reduction of from 15 to 20 per cent on all its products with the exception of crankshaft grinding machines. No other reductions have been noted during the week.

Used machinery continues more in demand than new. This dealers attribute to the prices asked for new tools, and which they say are all out of proportions as compared with the prices which many used machinery dealers are asking for their equipment. It is said that a general reduction in the price of new tools no doubt would result in

Rolling Mill Jim Says You Don't Have To Holler For Help

Say Fellas':

Remember when we were all hollerin' "Help, Help." There seems to be enough of it now. So, with help aplenty and HUBBARD ROLLS, production ought to be good.

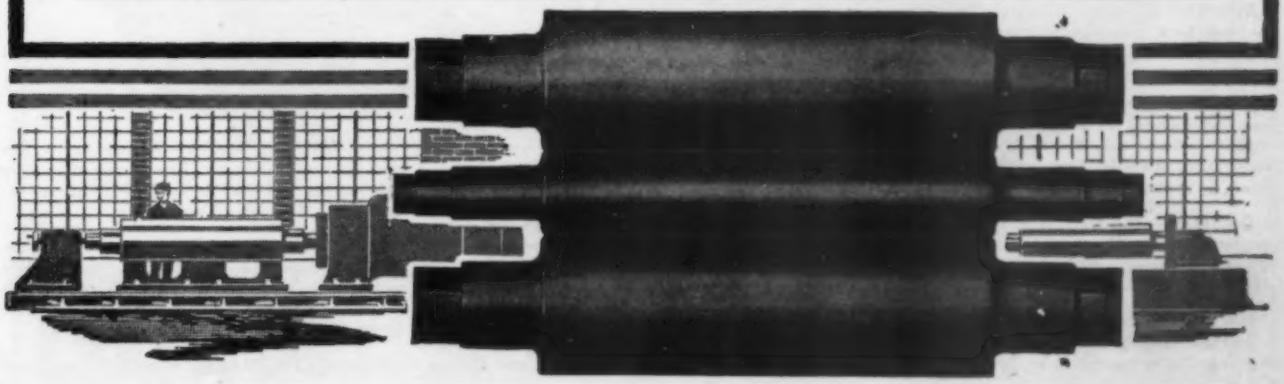
S' Long,

Rolling Mill Jim.

Hubbard Steel Foundry Co

EAST CHICAGO, IND.

All Kinds of Iron and Steel Rolls and Steel Castings



lower prices now being asked for secondhand equipment.

It is interesting to note the number of large manufacturing companies which are offering equipment from their plants for sale. Such companies in this district include the Central Metal Products Corp., Canton, O., which a week ago inquired for a number of presses and the Standard Pulley Co., Cincinnati. The former is understood to be offering a number of small presses for sale, while the latter is marketing a list of seven machines. Just what these offers indicate dealers are at a loss to state, but many believe these companies are planning to get rid of their old equipment in order to make way for new.

The inquiry issued a week ago by a Cincinnati buyer for a carload of small lathes is still open, as as yet it has not closed on this equipment. There are a number of other small inquiries in the market, and in most cases dealers do not expect to make actual sales for some time. The automotive industry, despite reports of increased activity, as yet has failed to come into the market, although it is understood that some small inquiries have been received from this direction. It is stated that insofar as accessory manufacturers are dependent upon the automotive industry, no business can be expected from them until the automobile business revives. Railroad demand also is lacking.

Demand Continues to Improve

TORONTO, Ont., Feb. 22.—The demand for machinery and machine tools in the Canadian market continues to improve. Inquiries are more numerous and many dealers are of the opinion that the greater part of these eventually will be turned into sales. No big lists are out but several fairly good contracts have been placed. Secondhand equipment continues to move at a good pace and those handling these lines are finding many customers among the old established manufacturing companies. Small tools sales are also improving. Users of small tools, who have been buying on a hand-to-mouth basis are coming forward with bigger lists and are stocking up more freely. The past week brought out an inquiry from the Canadian National railways for $5000 worth of small tools, mostly high speed drills, for the Moncton, N. B., shops. This with other business recently booked by dealers has had a stimulating effect on the Canadian market. Prices are again a feature of the market and during the past few days the Landis Tool Co. announced that on March 1, it will make reductions averaging from 15 to 20 per cent on its entire products, excepting crankshaft grinding machines.

Orders Constitute a Fair Volume

MILWAUKEE, Wis., Feb. 22.—Current orders received by machine tool manufacturers in this district constitute a fair volume, despite the fact that only one or two machines are involved in the individual requisition. The scattering character of new business has not shown any change. It would be difficult indeed to point to any one line of industry or group of industries of a class from which the largest number of orders are coming. New buying by automobile factories has been below expectations. Nevertheless, the inquiry from this source is daily becoming more active and some tangible results of the negotiations are confidently expected within a short time. Manufacturers of pumping engines, generating equipment and other heavy machinery continue to be in the tool market, but no round lots are being taken.

The consideration of price remains one of the principal factors around which business is revolving. The pressure for price reductions from buyers is undoubtedly the heaviest now that it has been since prewar days. Sellers, on the other hand, while anxious to do business, are not inclined to grant the concessions demanded.

Construction and Equipment

Concise and Timely Business Building Opportunities from the Field of Industry

Among New England Plants

ARLINGTON, MASS.—The Semi-Unit Corp. has been incorporated to make instruments with $5000 capital stock, by L. L. Goold, Waldo A. Gregg, Newtonville, Mass. and M. B. Sloan.

BOSTON—Bellamy Millwright & Machine Co. has been incorporated for $40,000. Leon Bellamy, 3 Central avenue, Newtonville, is president and treasurer.

BOSTON.—The Heywood-Wakefield Co. has been incorporated to build machinery with $13,000,000 capital stock, by Charles H. Lang, Melrose, Mass., Levi H. Greenwood and Seth Heywood, both of Gardner, Mass.

BOSTON.—The Hart Mfg. Co. has been incorporated to build automobiles, etc., with $50,000 capital stock, by Herbert Causer, Herbert William Causer and A. E. Causer, all of Winthrop, Mass.

BOSTON.—The Cochrane Steam Specialty Co. of Massachusetts, has been incorporated with $20,000 capital stock, by Horace E. Sibson, Williams S. Hallowell and John C. Jones.

BOSTON.—The Four Wheel Hydraulic Brake Co. of Massachusetts has been incorporated with $5000 capital stock, by M. C. Sullivan, N. J. MacGaffin and F. Rosenthal.

BOSTON.—Peter L. Thompson, Inc., has been incorporated to build motor vehicles, etc., with $50,000 capital stock, by Peter L. Thompson, Natick, Mass., John V. O. Thompson and Robert W. Sliger, Arlington, Mass.

BOSTON.—Boylston Motors, Inc., has been incorporated to build motor vehicles, etc., with $50,000 capital stock, by C. H. Hutchinson, Watertown, Mass., James S. Whitelock and Leo Isgur.

BOSTON.—Gale-Sawyer Co. has been incorporated for $98,000 to manufacture machines, tools, etc. The directors are George O. Crawford, Charles E. Gale, 140 Webb St. Weymouth, treasurer, and C. M. Price.

BROCKTON, MASS.—The Edison Electric Illuminating Co. has been authorized to increase its capital stock $516,600 for acquisitions, extensions and additions.

LOWELL, MASS.—The Lowell Iron & Steel Co. has been formed by Bartholomew, George Frank and Phillip Scannell of the Scannell Boiler Works.

FITCHBURG, MASS.—Foundation is being laid for a boiler house, machine shop and service building to cost $95,000, for the Fitchburg Gas & Electric Co.

LYNN, MASS.—George J. Kelly, Inc., has been organized for $275,000 to manufacture metal goods. The incorporators are George J. Kelly, Robert A. Pritchard, 70 State street, Boston, and Theodore Eaton.

RANDOLPH, MASS.—Work has been start-

FOR ECONOMY OF SPACE AND POWER

—are you wasting either?

When you figure on big reductions with a train of spur gears be sure to take into consideration the wastage of space and power. Herringbone Gears make direct reductions as high as 20 to 1, thereby saving space and power losses.

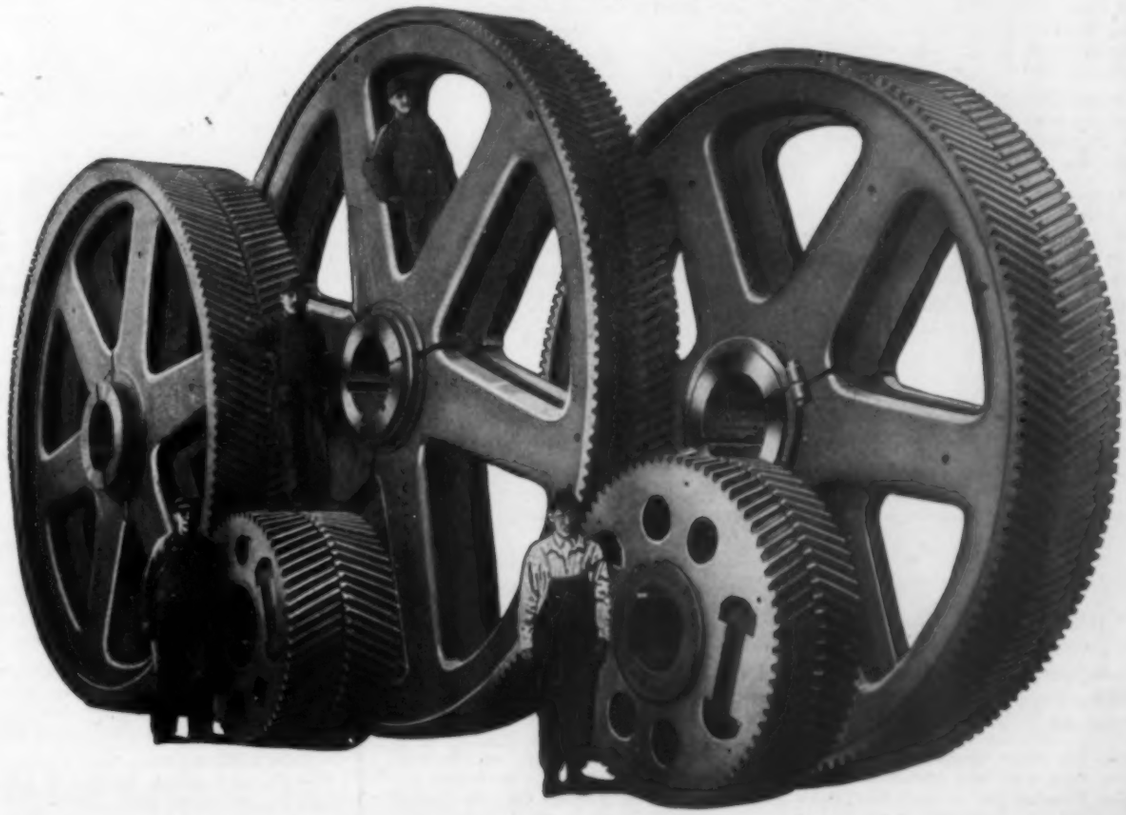
This type of gear has many other advantages: The action is continuous and smooth; there is no shock of transference from tooth to tooth; the teeth do not wear out of shape; the bending action of the load on the teeth is less than with straight gearing; "back-lash" is entirely absent; friction and mechanical losses are reduced to a minimum; herringbone gears can be used at greater velocities than any other kind.

Herringbone Gears are hobbed from the solid by means of special machinery to get precision heretofore not attained in gear cutting. They are far more efficient than belts, ropes, worm gears or compound trains of spur gears. They are particularly quiet in action and cause practically no vibration—two big advantages which are lacking in spur gears.

Our descriptive booklet contains much valuable information concerning gears and gearing problems. Send for it today.

The Falk Company, Milwaukee, Wis.

AGENTS: Pittsburgh—W. O. Beyer, 1007 Park Bldg. New York—M. P. Fillingham, 50 Church St. Wilkes-Barre—Vulcan Iron Works. Denver—Denver Engineering Works. San Francisco—F. W. Grimwood, Rialto Bldg. Montreal, Que., Can.—Engineering Equipment Co., Ltd., 263 St. James St.



FALK HERRINGBONE GEARS

ed on a 1-story, 50 x 75-foot factory for the Randolph Foundry Co., to cost $150,000.

WOBURN, MASS.—The Woburn Brass & Iron Foundry, Inc., has been incorporated with $75,000, by Daniel P. O'Brien, Thomas H. Marriman and George H. Foley.

SPRINGFIELD, VT.—Gilman & Sons is planning a machine shop.

PROVIDENCE, R. I.—The American Standard Watch Case Co., Inc., has been incorporated with $300,000 capital stock, by A. Y. Cunningham, Attleboro, Mass., Rudolph Schwarz, A. P. Duchesneau, N. A. Eisler and N. K. Winston.

BRIDGEPORT, CONN.—The Walker Silent Typewriter Co. has been incorporated for $500,000 to manufacture typewriters. Ario C. Walker and Leroy Hoover, of Bridgeport, and Charles W. Walker Jr., of Stratford, are the incorporators.

SOUTH NORWALK, CONN.—The Nash Engineering Co. has been incorporated with $500,000 capital stock, by Harry G. Liese, Brooklyn, N. Y., E. Kraijchie, Astoria, N. Y., and Arthur Rothstein.

North Atlantic States

ALBANY, N. Y.—The Simmons Machine Co., 985 Broadway, plans a 2-story plant addition at a cost of $75,000.

BROOKLYN, N. Y.—The Burley Welding Works is reported planning a 3-story addition to its plant.

BROOKLYN, N. Y.—The Seabring Copper Works has been incorporated with $25,000 capital stock, by R. J. Fleissner, J. D. Maxwell, F. V. Smith, 97 Clark street and others.

BROOKLYN, N. Y.—The Lexington Iron Works has been incorporated with $10,000 capital stock, by Q. Santag Jr., A. Pascarelli and B. Gluck, 160 High street.

BROOKLYN, N. Y.—The Fulton Smelting & Refining Works has been incorporated with $25,000 capital stock, by E. Aron, A. Sebring and A. Keller, 604 Sixth street.

BUFFALO.—The Registrometer Corp. has been incorporated to make calculating machines, etc., with $10,000 capital stock, by G. Walter, C. J. Smith and C. E. Baldwin.

BUFFALO—The A. D. Cutting Corp., 1170 Jefferson avenue, plans a 5-story warehouse and plant building, 125 x 137 feet, to be devoted to the manufacture of automobile bodies. It will cost about $100,000.

CARTHAGE, N. Y.—D. J. Renaud & Son, foundry, has been incorporated with $20,000 capital stock, by H. and F. and D. J. Renaud.

DEPEW, N. Y.—The Roll Bros Mfg. Corp. has been incorporated to make light machines, etc., with $100,000 capital stock, by W. and L. and R. Roll.

DUNKIRK, N. Y.—The Commercial Machine Co. plans a factory building, 1-story, 47 x 157 feet, to cost about $20,000.

FLUSHING, L. I.—A 4-story, 60 x 135-foot factory building will be erected here by the Gils Engineering Co., Grand Central Palace, New York.

GRANVILLE, N. Y.—The Telescopic Coy Bed Co. plans a factory and boiler house, 1-story, 70 x 420 feet.

JAMESTOWN, N. Y.—The Barkay Co., foundry, has been incorporated with $10,000 capital stock, by F. A. Richter, W. E. Kidd and H. A. Bauer.

LONG BEACH, N. Y.—The Long Beach Power Co. plans a power house addition, 1-story, 40 x 80 feet, to cost about $125,000.

LONG ISLAND CITY, N. Y.—The Moto Meter Co. plans a 1-story power house, 16 x 40 feet.

MALONE, N. Y.—The Riley-Kellogg Co. has been incorporated with $75,000 capital stock, by F. J. Riley, W. and A. L. Kellogg, to manufacture hardware and other metal products.

NEW YORK.—The New York Mutual Gas Light Co. plans alterations to its boiler house, at an estimated cost of $40,000.

NEW YORK.—Carnahan & Dalzell, electrical machines, has been incorporated with $20,000 capital stock, by B. Gunn, R. O. Carnahan and R. N. Dalzell, Great Kills, S. I.

NEW YORK—The W. N. Best Furnace & Burner Corp. has been incorporated with $1,000,000 capital stock, by M. Rogers, B. J. Sykes and W. H. Gillon, 1246 Pacific street.

NEW YORK.—The Victor Welding Works has been incorporated with $20,000 capital stock, by W. and O. and O. Malinka Jr., 358 East Fifty-seventh street

NEW YORK—The Royal Bed Mfg. Corp. has been incorporated with $10,000 capital stock by J. and A. Wilinsky and E. S. Sharer, 130 Dumont avenue.

NEW YORK.—The Acme Rim Mfg. Corp. has been incorporated with $15,000 capital stock, by W. P. White, L. B. Wisnevsky and L. N. Larson, 4814 New Utrecht street.

NEW YORK—The Master Phone Corp. of America has been incorporated with $150,000 capital stock, by H. Rein, F. C. White and A. M. Hann, 431 East 136th street.

NEW YORK.—The United Kitchen Equipment Co. has been incorporated with $10,000 capital stock, by N. Greitzer, H. Schoonfeld and W. Senderowitz, 1521 Fulton avenue.

NEW YORK.—The Great Eastern Iron Works recently was incorporated with $12,000 capital stock, by L. Qvatinets, J. Cohen and H. G. Harris, 716 West 180th street.

NEW YORK—The Lotos Motor Equipment Co. has been incorporated with $10,000 capital stock, by F. Michaels, J. W. Smith and H. A. Shea, 2 Rector street.

NEW YORK—Waldron & Van Winckle, 27 Wall street, are preparing plans for a foundry, 115 x 252 feet, for the Windsor Foundry Co., Windsor, Vt.

NEW YORK—The Waters Arc Welding Corp. recently was incorporated with $100,000 capital stock, by F. C. Lord, H. A. Miller and A. K. George, 166 West Seventy-seventh street.

NEW YORK—The Porter Electric Carburetor Co. has been incorporated with $300,000 capital stock, by F. B. and F. W. Skinner and A. W. Porter, 26 West Thirty-sixth street, to manufacture carburetors and ignition equipment.

NEW YORK—The Audiograph Co. of America has been incorporated with $100,000 capital stock, by E. Celony, E. E. Reis and H. Herzbrun, 220 West Forty-second street, to manufacture sound reproducing equipment.

POUGHKEEPSIE, N. Y.—The Storage Battery Parts & Equipment Co. has been incorporated with $50,000 capital stock, by H. Eggleston, J. W. Bitts and W. S. Lent.

SYRACUSE, N. Y.—A $20,000 machine shop will be erected by the Greiner-Semon-Lowry Co. Plans call for a structure one story, 24 x 52 feet, and 40 x 126 feet.

BRADFORD, PA.—The plant of the Fowler Foundry Co. recently was damaged by fire.

BRADFORD, PA.—The Sterling Steel Foundry Co. is reported planning to rebuild its machine shop recently damaged by fire.

JOHNSTOWN, PA.—The Liberty Steel Wire Products Co. has been incorporated with $25,000 capital stock, to manufacture wire goods, by Charles B. McCoy and others.

LANCASTER, PA.—The Liberty Can & Sign Co. is reported planning a 4-story plant addition, 80 x 80 feet.

LEWISTON, PA.—The Pennsylvania Wire Glass Co. plans a plant.

NEW KENSINGTON, PA.—The Union Spring & Mfg. Co. plans a 1-story plant addition, 20 x 65 feet, to cost about $10,000.

PHILADELPHIA—The Belgrade Wagon

(*Continued on page* 588)

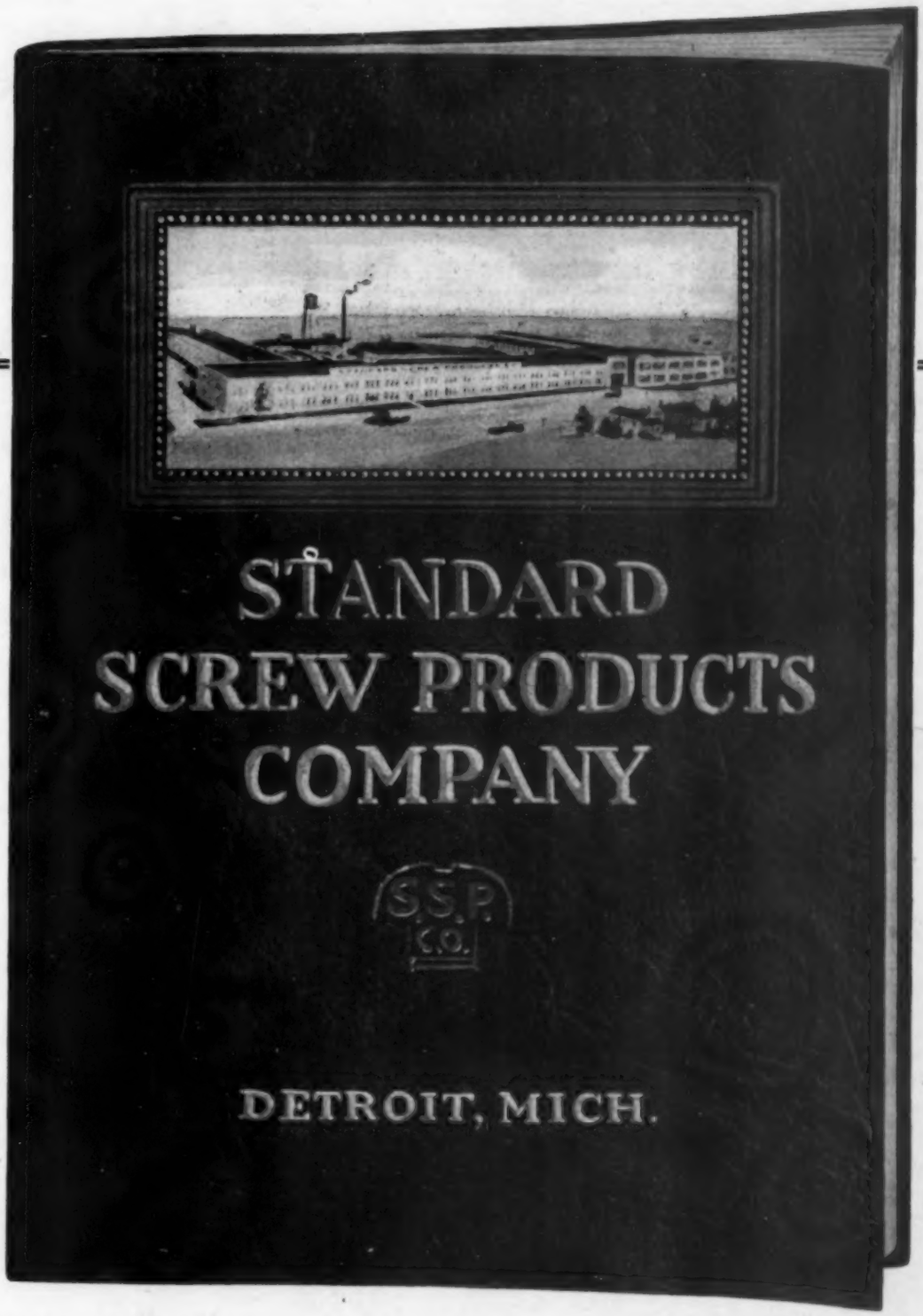
More Power Developments Proposed

THREE applications for permits or licenses under the Federal water power act were filed with the Federal Power commission, Washington, during the week ended Feb. 12, making a total of 174 applications received by the commission to date. The new applications are as follows:

Dam for power development, approximately three miles long across the head of Bayou Cocodrie, in Rapides and Evangeline parishes, Louisiana, proposed by the Louisiana Gravity Canal Co., Alexandria, La. Project No. 172.

Dam 30 feet high and about 2000 feet long, with power house and navigation locks located in the dam, at Kings island, in the Connecticut river at Windsor Locks, Conn., to develop about 32,000 horsepower. Proposed by the Connecticut River Co., 50 State street, Hartford, Conn. Project No. 173.

Transmission line 12 miles long, in the Sequoia national forest, California, from the Kern river plant to main line substations. Proposed by the Southern California Edison Co., Edison building, Los Angeles. Project No. 174.



The Above Catalogue Is a Compilation of Valuable Information for the Buyer, Illustrating and Describing Special Screw Machine Products, as Well as the Well Known Standards Manufactured by Us.

Iron and Steel Scrap Prices

CORRECTED TO TUESDAY NOON GROSS TONS DELIVERED TO CONSUMER

Steel Works Scrap

HEAVY MELTING STEEL

Pittsburgh	$15.00 to 16.00
Chicago	15.00 to 15.50
Eastern Pennsylvania	14.00 to 15.00
Cleveland	14.00 to 14.50
St. Louis	14.00 to 14.50
Buffalo	15.00 to 15.50
New York (dealers)	9.50 to 10.00
Birmingham	15.00 to 16.00
Cincinnati	15.00 to 16.00
Valleys	15.00 to 15.50
Boston (dealers)	8.50 to 9.50
Detroit	11.00

BUNDLED SHEETS

Pittsburgh	$11.00 to 12.00
Eastern Pennsylvania	13.50 to 14.50
Cleveland	7.00 to 8.00
Buffalo	10.00 to 11.00
Cincinnati	9.00 to 10.50
St. Louis	7.00 to 7.50

STEEL RAILS, SHORT

Chicago	$16.50 to 17.00
Boston (dealers)	12.00 to 13.00
Cleveland	11.00 to 12.00
St. Louis	14.50 to 15.00
Birmingham	15.00 to 16.00
Cincinnati	15.50 to 16.00
Detroit	15.00 to 16.00

STOVE PLATE

Pittsburgh	$16.00 to 17.00
Chicago	19.50 to 20.00
Eastern Pennsylvania	16.00 to 17.00
Cleveland	15.00 to 16.00
Detroit	19.00 to 20.00
Birmingham	17.00 to 18.00
Buffalo	17.00 to 18.00
New York	15.00 to 15.50
St. Louis	17.25 to 17.75
Cincinnati	19.00 to 21.00
Boston (consumers)	14.00 to 14.50

LOW PHOSPHORUS

Pitts., billet and bloom crops	$22.00 to 23.00
Cincinnati	23.00 to 24.00
Buffalo	21.00 to 22.00
Eastern Pennsylvania	21.00 to 22.00

SHOVELING STEEL

Chicago	$14.50 to 15.00
St. Louis	13.00 to 13.50
Pittsburgh	12.00 to 12.50

KNUCKLES, COUPLERS & SPRINGS

Pittsburgh	$16.00 to 17.00
Chicago	16.00 to 16.50
St. Louis	14.50 to 15.00
Eastern Pennsylvania	18.00 to 20.00

COMPRESSED SHEETS

Pittsburgh	$12.00 to 13.00
Chicago	12.00 to 12.50
Buffalo	12.00 to 13.00

FROGS, SWITCHES, GUARDS

Chicago	$15.00 to 15.50
St. Louis	14.00 to 14.50
Eastern Pennsylvania	14.00 to 15.00

BOILER PLATE, CUT

Detroit	$9.50 to 10.50
St. Louis	9.00 to 9.50

ANGLE BARS—STEEL

Chicago	$15.00 to 15.50
St. Louis	13.50 to 14.00

Iron Mill Scrap

RAILROAD WROUGHT

Pittsburgh, No. 1	$16.00 to 17.00
Pittsburgh, No. 2	15.00 to 16.00
Chicago, No. 1	15.50 to 16.00
Chicago, No. 2	15.00 to 15.50
Eastern Pennsylvania No. 1	20.00 to 21.00
Cleveland, No. 1	15.00 to 16.00
St. Louis, No. 1	14.00 to 14.50
St. Louis, No. 2	13.50 to 14.00
Buffalo	20.00 to 21.00
Cincinnati	16.00 to 17.00
Birmingham, No. 1	16.00 to 17.00
New York, No. 1 (dealers)	15.50 to 16.00
Boston (dealers)	13.00 to 13.50

WROUGHT PIPE

Eastern Pennsylvania	$14.50 to 15.50
Buffalo	13.00 to 14.00
New York (dealers)	10.50 to 11.00
Boston (dealers)	10.50 to 11.00

YARD WROUGHT

Boston	11.50 to 12.00
Eastern Pennsylvania, No. 1	16.00 to 18.00

CITY WROUGHT

New York, long	$13.00 to 14.00

BUSHELING

Chicago, No. 1	$15.00 to 15.50
Chicago, No. 2	11.50 to 12.00
Cleveland, No. 1	10.00 to 11.00
Cleveland, No. 2	7.00 to 8.00
St. Louis, No. 1	14.00 to 14.50
Buffalo, No. 1	13.00 to 14.00
Cincinnati, No. 1	16.00 to 17.00
Eastern Pennsylvania, No. 1	15.50 to 16.00

MACHINE SHOP TURNINGS

Pittsburgh	$10.00 to 11.00
Chicago	7.50 to 8.00
Eastern Pennsylvania	12.50 to 13.00
Cleveland	9.00 to 9.25
Buffalo	11.00 to 12.00
New York (dealers)	8.50 to 9.00
St. Louis	5.50 to 6.00
Detroit	5.25 to 5.75
Cincinnati	6.50 to 7.50
Birmingham	8.00 to 10.00
Valleys	8.00 to 8.25
Boston (dealers)	6.50 to 7.00

CAST IRON BORINGS

Pittsburgh	$11.50 to 12.50
Chicago	11.25 to 11.75
Eastern Pennsylvania	12.00 to 13.00
Eastern Pennsylvania (chem.)	14.00 to 15.00
Cleveland	12.00 to 13.00
St. Louis	9.50 to 10.00
Detroit	7.00
Buffalo	11.00 to 12.00
New York (dealers' price)	10.00 to 11.00
Cincinnati	10.00 to 11.00
Birmingham	8.00 to 10.00
Valleys	12.00 to 12.50
Boston (dealers)	7.00 to 7.50
Boston (chemical)	9.50 to 10.00

MIXED BORINGS AND TURNINGS

(For blast furnace use)

Eastern Pennsylvania	$10.00 to 11.00
Boston (dealers)	5.50 to 6.00
Cleveland	10.00 to 12.00

IRON AXLES

Pittsburgh	$36.00 to 37.00
New York (dealers)	33.00 to 34.00
Chicago	38.50 to 39.00
Eastern Pennsylvania	30.00 to 31.00
Detroit	39.00
Cleveland	28.00 to 29.00
St. Louis	32.00 to 32.50
Buffalo	30.00
Cincinnati	36.00 to 37.00
Birmingham	25.00 to 27.00

IRON RAILS

Chicago	$22.50 to 23.00
Cleveland	17.00 to 18.00
St. Louis	18.00 to 18.50
Buffalo	21.00 to 22.00
Cincinnati	25.00 to 26.00

PIPES AND FLUES

Chicago	$11.75 to 12.25
Cleveland	9.00 to 10.00
Detroit	10.50 to 11.25
St. Louis	11.50 to 12.00
Cincinnati	12.00 to 13.00

GRATE BARS

Chicago	14.50 to 15.00
Cleveland	19.00 to 20.00
Detroit	14.00 to 15.00
Buffalo	14.00 to 15.00
New York (dealers)	15.50 to 16.00
Eastern Pennsylvania	17.00 to 18.00

FORGE FLASHINGS

Cleveland, large	$9.00 to 10.00
Chicago, small	10.50 to 11.00
Cleveland, small	8.00 to 9.00
Boston (dealers)	7.00 to 7.50

FORGE SCRAP

Chicago	$16.00 to 16.50
Eastern Pennsylvania, No. 1	15.00 to 16.00
Boston	7.00 to 7.50

ARCH BARS AND TRANSOMS

Chicago	$25.00 to 25.50
St. Louis	21.00 to 21.50

ANGLE BARS—IRON

Chicago	$21.00 to 21.50
St. Louis	19.00 to 19.50

Iron and Steel Works Scrap

AXLE TURNINGS

Pittsburgh	$12.00 to 13.00
Eastern Pennsylvania	13.50 to 14.50
Boston (dealers)	7.00 to 7.50
St. Louis	8.00 to 8.50
Detroit	11.00
Cleveland	13.50 to 14.00
Buffalo	14.50 to 15.50
Chicago	11.50 to 12.00

STEEL CAR AXLES

Pittsburgh	$22.00 to 23.00
Eastern Pennsylvania	25.00 to 26.00
Cleveland	25.00 to 26.00
St. Louis	18.00 to 18.50
Buffalo	25.00 to 26.00
Chicago	18.50 to 19.00
New York (dealers)	18.00 to 19.00
Birmingham	20.00 to 21.00
Boston (dealers)	17.50 to 18.00
Detroit	20.00

SHAFTING

Eastern Pennsylvania	$25.00 to 26.00
St. Louis	20.00 to 20.50
New York (dealers)	19.00 to 20.00
Chicago	26.00 to 26.50
Boston (dealers)	17.00 to 18.00

Iron Foundry Scrap

CAR WHEELS

Pittsburgh, iron	$21.00 to 22.00
Pittsburgh, steel	16.00 to 17.00
Chicago, iron	20.00 to 20.50
Eastern Pennsylvania, iron	23.00 to 24.00
Cleveland, iron	35.00 to 36.50
St. Louis, iron	19.00 to 19.50
Buffalo, iron	24.00 to 25.00
Birmingham, iron	21.00 to 21.50
Birmingham, tram car	20.00 to 21.00
Boston (consumers)	24.00 to 24.50
Cincinnati	22.00 to 23.00
New York, iron	21.00 to 22.00
Detroit	25.75 to 26.75

NO. 1 CAST SCRAP

Pittsburgh, cupola	$22.00 to 23.00
Chicago, cupola	21.00 to 21.50
Eastern Pennsylvania, cupola	22.50 to 23.50
Cleveland, cupola	21.00 to 22.00
New York cupola (dealers)	19.00 to 20.00
Cincinnati, No. 1, machinery, cupola (net)	21.00 to 22.00
Detroit	18.00
Birmingham, cupola	20.00 to 21.00
St. Louis, railroad	19.00 to 19.50
St. Louis, agricultural	18.50 to 19.00
Buffalo	20.00 to 21.00
Boston (consumers)	22.50 to 23.50
Valleys	21.00 to 22.00

HEAVY CAST

New York (dealers)	$18.00 to 19.00
Buffalo	19.00 to 20.00
Pittsburgh	16.00 to 17.00
Cleveland	14.00 to 14.50
Boston (consumers)	18.00 to 19.00

MALLEABLE

Pittsburgh, railroad	$15.00 to 16.00
Pittsburgh, agricultural	13.00 to 14.00
Chicago, railroad	17.00 to 17.50
Chicago, agricultural	17.00 to 17.50
Eastern Pennsylvania, railroad	18.00 to 20.00
Cleveland, railroad	17.50 to 18.00
Cleveland, agricultural	14.00 to 15.00
St. Louis, railroad	13.50 to 14.00
St. Louis, agricultural	14.00 to 14.50
Cincinnati, railroad	15.00 to 16.50
Cincinnati, agricultural	16.00 to 17.00
Boston, railroad	15.00 to 16.00
Buffalo	15.00 to 16.00
Detroit	13.00

Miscellaneous Scrap

REROLLING RAILS

5 feet and over

Pittsburgh district	$16.00 to 17.00
Chicago	15.25 to 15.75
Eastern Pennsylvania	18.00 to 20.00
Cleveland	17.00 to 18.00
St. Louis	15.50 to 16.00
Birmingham	15.00 to 16.00
Boston (dealers)	12.50 to 13.00
New York (dealers)	15.00 to 16.00

LOCOMOTIVE TIRES

Chicago	$14.25 to 14.75
St. Louis	11.00 to 11.50

LOW PHOSPHORUS PUNCHINGS

Chicago	$18.00 to 18.50
Eastern Pennsylvania	20.00 to 21.00
Pittsburgh	17.00 to 18.00

When the Scrap Market Is Dull

While seeking a more favorable market the best form in which to hold your sheet scrap, etc., and the form that always commands the best prices is the dense hydraulically compressed bundle.

Thus less storage space is required—under roof to prevent loss from corrosion; and because of greater car tonnage under minimum car rate, you add from 25% to 50% freight savings to your profits.

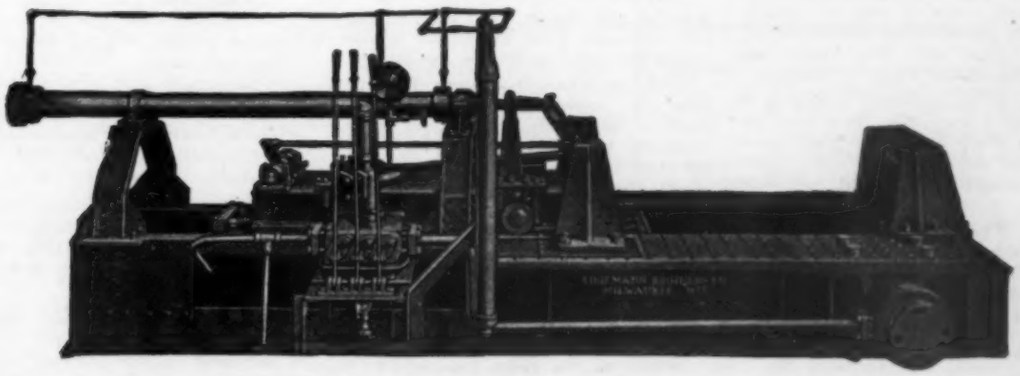
For greatest compression, largest daily output, at lowest operating cost, use

LOGEMANN Double Ram Hydraulic Scrap Metal PRESSES

You can enjoy the advantage of the accumulated experience from hundreds of Logemann scrap bundling presses now in use.

They embody a simplified mechanism that requires no special skill to operate rapidly. Press and pump are so designed that all the motive power applied is utilized, thus reducing power cost.

Powerfully built, all working parts constructed to resist the severest strains—selected material, first class workmanship—all minimize upkeep cost and insure lasting efficiency.



A medium sized press is shown; there are smaller and larger sizes in standard models.

Advise character and daily tonnage of your scrap and let us suggest press best suited to your requirements.

Logemann Brothers Co.

3126 Burleigh Street
Milwaukee, Wis.

Builders of Baling Presses and Hydraulic Machinery

(*Continued from page 584*)

Works plans a 2-story plant addition, 61 x 90 feet.

PHILADELPHIA—An addition will be erected by the Steel Fittings Co., 2619 Chestnut street.

WYALUSING, PA.—The plant of the Palmer Machine Co. recently was damaged by fire.

ATLANTIC CITY, N. J.—The Pullman Chair Co. has been incorporated with $125,000 capital stock, by Paul S. Keller, J. M. Rowland, I. H. Coyne and others, to manufacture rolling chairs.

BOUND BROOK, N. J.—The Ibex Rubber Corp. has been incorporated with $125,000 capital stock, by Harry J. Lindsley, George O. Smalley and William F. Jennings, to manufacture mechanical rubber products.

CAMDEN, N. J.—The International Aero Construction Co. has been incorporated with $25,000 capital stock, to manufacture airplanes, etc., by F. R. Hansell, John MacPeak and others.

EAST ORANGE, N. J.—C. & V. Mfg. Co., Inc., has been incorporated with $100,000 capital stock, to manufacture tools, by Gordon Grand, 525 Main street and others.

ELIZABETH, N. J.—Hunter Bros., Inc., has been incorporated with $50,000 capital stock, by Joseph B. Richard, J. and James F. Hunter, 334 Morris avenue, to manufacture electrical appliances, etc.

FARMINGDALE, N. J.—The plant of the New Jersey Machinery Co., recently sold to Steven S. Groggins, Brooklyn, will be used for the manufacture of chemicals.

MONTCLAIR, N. J.—The Magnallow Metal Corp. of America has been incorporated with $125,000 capital stock, by Walter Lohry, Julius Kumpa and Augustus L. Friedman to manufacture metal products.

NEWARK, N. J.—The Newark Millwright Co., 28 Mechanic street, has been organized by William G. Minugh and others.

NEWARK, N. J.—The Albert Co., 810 Broad street, has been incorporated with $10,000 capital stock, to manufacture hardware, by Nathan H. Bergerm, S. N. Search, and others.

UNION, N. J.—The Public Safety Signal Corp. has been incorporated with $10,000 capital stock, by Hugo Faller, L. Faller and Harry A. Klein.

DANVILLE, VA.—The Danville Truck & Tire Co. has been incorporated with $50,000 capital stock, by J. L. Walker, W. R. Dunn and S. T. Tole, to manufacture automobile truck equipment, etc.

VICKSBURG, VA.—The B. J. Robinson Machine Works has been incorporated with $30,000 capital stock, by B. J., S. B. and A. H. Robinson, to manufacture machinery and tools.

Central States Activity

APPLETON, WIS.—The business of the Acme Body Works, established here two years ago, has been incorporated under the same name, with a capital stock of $60,000. It manufactures passenger and commercial car bodies, truck cabs, etc. The owners are George W. Wiegand and Christ C. Seeger.

HORICON, WIS.—Architects Parkinson & Dockendorff, La Crosse, Wis., have been engaged to draw plans for a new high school with vocational training shops. Gift funds and other appropriations amount to about $175,000.

KENOSHA, WIS.—H. E. Toelle, Ralph W. Brown and Benj. Poss appear as the incorporators of the Mid-Western Co., of Kenosha, which has been organized with a nominal capital of 500 shares of non-par value common stock to manufacture, buy, sell and deal in all kinds of mechanical apparatus, machinery, etc.

MANITOWOC, WIS.—Articles of incorporation have been filed by the Victor Krefl Mfg. Co., organized with $7500 capital to manufacture automobile accessories. The incorporators are Victor Krefl, Adolph Kummerow and H. C. Wenorf.

MILWAUKEE—The foundry of Hirsch Bros., manufacturer of agricultural implements, recently was damaged by fire.

MILWAUKEE—The Precision Stud & Bolt Co. has been incorporated with a capital stock of $20,000, by G. A. Gessner, H. M. Langer and M. E. Engle to manufacture studs, bolts, screws, nuts, washers, etc.

NEW RICHMOND, WIS.—The Hemp Co. of America, 80 East Jackson boulevard, Chicago, is contemplating the construction of a new mill at this plant. A rope mill is now operated in leased quarters. The proposed investment will be about $100,000. R. D. Jenkins, Chicago, is president.

PRAIRIE DU CHIEN, WIS.—The capital stock of the Prairie City Electric Co. has been increased from $30,000 to $75,000 to provide for improvements in the plant.

SPARTA, WIS.—The Sparta Drilling Machine Co., capitalized at $2500, has been chartered to manufacture machine tools and machinery by Alfred James, Robert Canfield and Leo Canfield.

WHITEHALL, WIS.—Architect A. D. Conover, Tenney block, Madison, Wis., is preparing plans for a power house and boiler plant, one story, 44 x 75 feet, for the county asylum at Whitehall, Wis. Bids close March 11, at Whitehall.

DETROIT.—The Michigan Stamping Co. plans a factory building addition.

DETROIT—The Zenith Foundry Co., Miller avenue, is building a foundry, 90 x 200 feet.

DETROIT.—The Wheel Truing Brake Shoe Co. plans a factory and office building, 2-stories, 50 x 80 feet.

DETROIT—The Ever-Hot Heater Co., capitalized at $50,000, has been chartered by Delmar C. Briggs, Walter H. Fortune and Frank W. Schuell, 5229 Cass avenue.

DETROIT—The Monarch Stamping Co., capitalized at $25,000, has been chartered to manufacture machine parts and metal stampings by Russell E. Angor, Hugo Stange and Otto H. Angor, 385 Ferdinand avenue.

HUDSON CITY, MICH.—The Southern Michigan Brass Foundry Co. has been incorporated with $5000 capital stock to manufacture, brass, aluminum and bronze castings.

LANSING, MICH.—The Simon Iron & Steel Corp. has been incorporated with $50,000 capital stock.

MARYSVILLE, MICH.—The Illinois Tool Co. plans two factory buildings, 1-story, 400 x 1200 feet.

CHICAGO—The R. Stutzke Co., 38 South Dearborn street, capitalized at $50,000, has been chartered to manufacture machinery by Cuthbert Schaefer and T. G. Renschel.

CHICAGO.—The Service Parts Corp., 616 South Michigan avenue, has been incorporated with $1000 capital stock, by E. S. Carlisle, C. H. Scribner and F. C. West.

CHICAGO.—The Crawford Steel Corp., 341 North Crawford avenue, has been incorporated with $100,000 capital stock, by Eric Winters, Aaron E. Rosenthal and R. W. Partridge.

CHICAGO—The Runzel Lenz Electric Mfg. Co., 1751 North Western avenue, plans a 2-story plant building, 50 x 60 feet, to cost about $20,000.

CHICAGO—The Argus Mfg. Co., 502 North Pauline street, manufacturer of metal specialties, is building a 1-story factory, 125 x 140 feet.

CHICAGO—The Independent Screw Corp., 3018 Twenty-first place, has been incorporated to manufacture screws, etc., with $75,000 capital stock, by H. E. Bremer, F. A. Lahsin, C. Herbert Weaver and others.

CHICAGO—The Joseph Lewis Metals Co., Inc., 528 First National Bank building, capitalized at $20,000, has been chartered by Benjamin Colitz, Joseph Lewis and Morris E. Fewell.

CHICAGO—Grinnell F. Oliver & Co., 2450 South Wabash avenue, has been incorporated to manufacture machinery, etc., with $10,000 capital stock, by A. J. Shuttan, F. J. Moserow, Grinnel F. Oliver and others.

CHICAGO—The Universal Coupling Co., 5308 Ellis avenue, has been incorporated with $50,000 capital stock to manufacture couplings, castings, etc., by C. A. Luce, Jacob Katz, H. H. McCormick and others.

CHICAGO.—The Progressive Iron & Metal Co., Inc., 1503 South Halsted street, has been incorporated with $15,000 capital stock, by Joseph Fishman, Charles Chernyk, Rosa Fishman and others.

CHICAGO.—The Imperial Japanning & Enameling Works, Inc., 408 West Grand avenue, has been incorporated with $100,000 capital stock, by Joseph V. Janda, A. Skailand, William Link and others.

CHICAGO—The Western Fixture Mfg. Co., 3037 Elston avenue, capitalized at $100,000, Papliua street, manufacturer of metal specialties by Thomas Lissy, Frank Blomski and Edmund Kissling.

CHICAGO—The Support Die & Stamping Works, Inc., 530 North La Salle street, has been incorporated to engage in metal stamping, toolmaking, etc., by James H. Carney, E. C. Tourje, W. F. Waugh and others.

CHICAGO—The A. B. C. Road Machinery Co., 616 Reaper block, capitalized at $3000, has been chartered to manufacture machinery, culverts and other metal articles by Floyd Allen, R. J. Blumberg and M. W. Carrick.

CHICAGO.—The Chicago Radio Apparatus Co., Inc., 508 South Dearborn street, has been incorporated to manufacture and deal in machinery, radio apparatus, etc., with $15,000 capital stock, by Leonard L. Lynn, Clarence C. Klentz and others.

CHICAGO.—The Adaptu Carburetor & Mfg. Co., 224 North Wells street, has been incorporated to manufacture and deal in carguretors etc., with $250,000 capital stock, by A. J.

Hauskins, Wilbur F. Sheron, Joseph Lasham, Edward Kibben and others.

CHICAGO.—Helsbels, Inc., 127 North Dearborn street, has been incorporated to manufacture and deal in locking devices with 400 shares of no par value stock, by Oliver S. Kopley, William J. Williams and Richard C. Bradley.

CHICAGO HEIGHTS, ILL.—The Railway Steel Spring Co., 30 Church street, New York, is building an addition to its plant here.

MOLINE, ILL.—The Howlett Construction Co., Sohrbeck building, capitalized at $40,000, has been chartered to manufacture elevators and machinery by W. H. Howlett, Bay City, Mich.; Lawrence Roys, Moline, and S. M. Howlett, Stoughton, Wis.

OAK PARK, ILL.—The Oak Park Engineering & Mfg. Co., 244 Chicago avenue, has been incorporated with $20,000 capital stock, to manufacture and deal in dies, machinery, etc., by Mary Evesner, Siegmund Evesner and others.

ROCKFORD, ILL.—The Rockford Power Machinery Co., 706 Seventh street, capitalized at $35,000, has been chartered to manufacture electric rewinding machinery by Charles B. Joyce, Ray Brown and Perry C. Brown.

ROCKFORD, ILL.—The Reliable Machine Co., 1324 Tenth avenue, capitalized at $15,000, has been chartered to manufacture special machinery and metal devices by F. A. Forsberg, Charles A. Forsberg and G. A. Forsberg.

SPRINGFIELD, ILL.—The Chicago & Alton railroad, Transportation building, Chicago, will build a shop and roundhouse costing $300,000.

WAUKEGAN, ILL.—The General Boilers Co., capitalized at $1,500,000, has been chartered to manufacture boilers and boiler equipment by C. T. Nelson, H. M. Reynolds and A. H. Chrisman.

ANDERSON, IND.—The Fulton Tractor Mfg. Co. plans a 1-story plant building at a cost of $100,000.

ADRIAN, MICH.—The Andrix Lock-Nut Co. plans an addition.

ANDERSON, IND.—The Howe Fire Apparatus Co. has been incorporated with $150,000 capital stock and has leased a plant. B. J. C. Howe is president of the company.

GOSHEN, IND.—The Wegner Utility Auto Body Co. has been incorporated with $50,000 capital stock, by E. H. Hewit, F. A. Wegner and E. S. Olson, to manufacture automobile bodies.

INDIANAPOLIS—Two 1-story additions will be built to the plant of the ert H. Hassler, Inc., 1533 Naomi street, to provide additional facilities for the manufacture of automobile parts.

LA FAYETTE, IND.—The Monon railroad will build an enclosed car shop costing $200,000, for the repair of steel freight cars.

MUNCIE, IND.—The Hook Cultivator Fender Co. has leased a plant here. It was recently incorporated with $50,000 capital stock.

AKRON, O.—The Wanita Chemical Co. has been incorporated with $50,000 capital stock, by W. L. Harnevious, S. N. James, W. H. Floto and J. D. Hartman.

BAY VILLAGE, O.—The Northern Ohio Light & Power Co. is having plans drawn for a power plant, 1-story.

CLEVELAND—The Hagan Steel Co. has been incorporated with $50,000 capital stock, by J. Hagan, J. Kammer and others.

CLEVELAND.—The Cast Products Co. has been incorporated with $10,000 capital stock, by E. N. Corlett, A. G. Borchert, E. R. Janston, S. M. Corlett and H. C. Janston.

CLEVELAND.—The Cleveland Grinding Wheel Co. has been incorporated with $1000 capital stock, by R. W. Sanborn, C. R. Rich and others.

COLUMBUS, O.—The Universal Body Co. has been incorporated with $25,000 capital stock, by R. G. Martin, H. H. Orr, D. N. Postlewaite, R. McMurray and E. Houck.

DAYTON, O.—The Merry Whirl Swing Mfg. Co. has been incorporated with $10,000 capital stock, by C. F. Morgan, I. B. Morgan, R. O. Morgan, D. L. Higbee and J. R. Stephens.

DOVER, O.—The Dover Novelty & Plating Co. has been incorporated with $25,000 capital stock, by J. S. Whaley, C. Wenger, W. Huberun, R. Morhardt, P. Kneppelt and C. W. Mullet.

LIMA, O.—The Union Tank Car Co. plans a plant and is now having plans drawn for it.

SPRINGFIELD, O.—The Pennant Tool & Engineering Co. recently was incorporated with $25,000 capital stock, by A. R. Ignon, M. W. Swope and others.

MARION, O.—The Marion Implement Co. has been incorporated with $20,000 capital stock, by F. Haberman Jr., L. Lingo, R. D. Luke, L. H. Lightcan and T. Henderson.

MIDDLETOWN, O.—The Reduction Gear Co. has been incorporated with $10,000 capital stock, by G. Harvey, T. Harvey, W. E. Sharkey, Granville Zecher and A. R. Harvey.

YOUNGSTOWN, O.—The Sheet Metal Mfg. Co. is having plans drawn for a warehouse, 1-story, 100 x 200 feet, to cost about $30,000.

YOUNGSTOWN, O.—The Standard Tractor Control Co. recently was incorporated by C. A. Manchester, Franklin B. Powers, L. M. Montgomery, J. C. Argetsinger and M. Seafert.

YOUNGSTOWN, O.—The Stucco-Steel Co. has been incorporated with $500 capital stock, by G. W. Bickerton, V. C. Walker, C. C. Frazer, G. F. Hammond and P. Faibus.

WAKEMAN, O.—The Wakeman & Butler Road Electric Co. has been incorporated with $30,000 capital stock, by F. Burk, J. M. Burk, C. G. Latterman, G. B. Blanden, W. P. Funk and M. O. Fay.

WARREN, O.—The Trumbull Bronze Co. has started operations in its new foundry, which is 40 x 120 feet.

CHARLESTON, W. VA.—Paul H. Kruger has organized a company with $50,000 capital stock, to manufacture combination handcuffs, etc., and plans to erect a plant.

DUNBAR, W. VA.—The Auto-Moto Mfg. Co. plans an addition to its plant.

HUNTINGTON, W. VA.—The A. F. Thompson Co., manufacturer of stoves, etc., has acquired the plant of the Climax Rubber Co., which it will use as a plant.

ITMAN, W. VA.—The Pocahontas Fuel Co. contemplates the erection of a machine shop and a coal tipple.

WHEELING, W. VA.—The Wheeling Axle Co. plans a factory building at a cost of $6500.

Throughout the West

MINNEAPOLIS.—The Twin City Separator Co. plans a plant addition, 1-story.

MINNEAPOLIS.—The Western Body Mfg. Co. plans a plant addition.

WELLS, MINN.—Martin F. Henjum contemplates a foundry building, 1-story, 50 x 150 feet.

CEDAR RAPIDS, IOWA.—The Cedar Rapids Tire & Rubber Co. plans a factory building, 2-stories, 128 x 300 feet, to cost $300,000.

DES MOINES, IOWA.—The Keith Furnace Co. plans a manufacturing plant to cost about $250,000.

SIOUX CITY, IOWA—The Sioux City Foundry & Boiler Co. has been organized by J. Kalin, A. J. Galinsky and Herman Galinsky, and has bought the plant of the Foundry & Mfg. Co., which it will re-equip.

EXCELSIOR SPRINGS, MO.—The Excelsior Springs Water, Gas & Electric Co. will build a transmission line.

JOPLIN, MO.—The P. A. Martin Machinery Co. plans a plant building, 100 x 140 feet.

JOPLIN, MO.—The E. A. Martin Machinery Co. plans a 1-story building, 50 x 100 feet, to cost about $35,000.

ST. LOUIS—The United Railways Co. will construct four electric plants for traction service.

Business in Canada

LONDON, ONT.—The London Motors, Ltd., have been incorporated to manufacture automobiles, engines, motor car accessories, etc., with $1,000,000 capital stock; by William R. Stansell, Thomas A. Conley, Thomas H. Griffith and others.

OTTAWA, ONT.—The Pure Hoist Air Furnace Co., Ltd., has been incorporated to manufacture furnaces, heating apparatus, etc., with $40,000 capital stock; by Maurice M. O'Connell, James S. Wilson, and others.

PETERBORO, ONT.—The city of Peterboro is making preparations for the construction of a filtration plant here to cost $350,000.

(Continued on Page 592)

Iron and Steel Prices

Iron Ore

Superior Ores, Per Ton, Lower Lake Ports

Old range Bessemer, 55 per cent iron	$7.45
Mesabi Bessemer, 55 per cent iron	7.20
Old range nonbessemer, 51½ per cent iron	6.70
Mesabi nonbessemer, 51½ per cent iron	6.55

Port Henry Iron Ore, f.o.b. Port Henry

Old bed 21 furnace	$5.80
Old bed concentrates, 63 per cent	6.70
Harmony, cobbed, 63 per cent	6.70
New bed, low phos., 65 per cent	9.50
Lump ore for fix	7.00

Manganese Ore

Brazilian, 48 to 50 per cent c.i.f. Atlantic ports, 35 to 40 cents per unit, nominal.

Indian 48 to 50 per cent c.i.f. Atlantic ports, 35 to 40 cents per unit, nominal.

FLUOR SPAR

Washed gravel Kentucky and Illinois mines, per ton.....$22.50 to 25.00

Warehouse Prices

Steel bars, Boston	3.63c
Steel bars, Chicago	3.48c
Steel bars, Cleveland	3.30c to 3.34c
Steel bars, Detroit	3.43c
Steel bars, Philadelphia	3.60c
Steel bars, New York	3.58c to 3.63c
Steel bars, St. Louis	3.575c
Steel bars, Cincinnati	3.58c
Steel bars, St. Paul	3.76c
Steel bars, Buffalo	3.50c
Steel bars, San Francisco	5.00c
Iron bars, Boston	3.65c
Iron bars, Buffalo	4.20c
Iron bars, Chicago	3.48c
Iron bars, Detroit	3.43c
Iron bars, St. Louis	3.57½c
Iron bars, Cincinnati	3.58c
Iron bars, Philadelphia	3.60c
Iron bars, New York	3.58c to 3.63c
Shapes, Chicago	3.58c
Shapes, Detroit	3.53c
Shapes, Boston	3.73c
Shapes, St. Louis	3.675c
Shapes, St. Paul	3.86c
Shapes, New York	3.68c to 3.73c
Shapes, Cleveland	3.40c to 3.44c
Shapes, Philadelphia	3.50c
Shapes, Buffalo	3.60c
Shapes, Cincinnati	3.68c
Shapes, San Francisco	5.10c
Plates, Buffalo	3.80c
Plates, Chicago	3.78c
Plates, Detroit	3.73c
Plates, Boston	3.93c
Plates, St. Louis	3.875c
Plates, St. Paul	4.06c
Plates, New York	3.88c to 3.93c
Plates, Cleveland	3.60c to 3.64c
Plates, Philadelphia	3.90c
Plates, Cincinnati	3.60c
Plates, San Francisco	5.50c
No. 10 blue anl. sheets, N. Y.	4.78c to 4.83c
No. 10 blue anl. sheets, Phila.	4.80c
No. 10 blue anl. sheets, Chi.	4.68c
No. 10 blue anl. sheets, Clev.	4.55c
No. 10 blue anl. sheets, Boston	5.20c
No. 10 blue anl. sheets, Buf.	4.70c
No. 10 blue anl. sheets, Det.	4.63c
No. 10 blue anl. sheets, St. L.	4.77½c
No. 10 blue anl. sheets, Cin.	4.78c
No. 10 blue anl. sheets, St. P.	4.96c
No. 10 blue anl. shts, San Fran.	6.76c
No. 28 black sheets, Chicago	5.73c
No. 28 blk. sheets, New York	5.88c
No. 28 blk. sheets, Phila.	5.75c
No. 28 blk. sheets, Cleveland	5.60c
No. 28 blk. sheets, Boston	6.05c
No. 28 blk. sheets, Cincinnati	5.68c
No. 28 blk. sheets, Detroit	5.60c
No. 28 blk. sheets, St. Louis	5.85c
No. 28 blk. sheets, St. Paul	6.00c
No. 28 blk. sheets, Buffalo	5.75c
No. 28 blk. sheets, San Fran.	7.25c
No. 28 galv. sheets, Chicago	7.10c
No. 28 galv. sheets, N. Y.	7.00c to 7.13c
No. 28 galv. sheets, Phila.	7.00c
No. 28 galv. sheets, Boston	7.40c
No. 28 galv. sheets, Cleveland	6.95c
No. 28 galv. sheets, Cincinnati	6.78c
No. 28 galv. sheets, Detroit	6.95c
No. 28 galv. sheets, Buffalo	7.10c
No. 28 galv. sheets, St. Louis	7.20c
No. 28 galv. sheets, San Fran.	8.75c

Freight Rates

PIG IRON

Mahoning and Shenango valleys to:	
Cleveland	$1.96
Newark, N. J.	6.72
Boston	7.28
Philadelphia	6.32
Pittsburgh	1.96
Chicago	5.32
St. Louis	6.44
Minneapolis, St. Paul	7.60
Buffalo to:	
Albany, N. Y.	$2.52
New England (rail)	5.46
New York and Brooklyn (rail)	5.46
Virginia furnaces to:	
Philadelphia	$5.74
New England	6.58
Brooklyn, Jersey City, Newark	6.16
Birmingham, Ala., to:	
Boston	$10.665
Boston (rail and water)	7.65
Cincinnati	4.50
Chicago	6.66
Cleveland	6.66
Louisville, Ky.	4.12
Minneapolis, St. Paul	9.73
New York	10.26
Philadelphia	8.665
Pittsburgh	7.60
Savannah, Ga.	4.25
St. Louis	5.725
Chicago to:	
Des Moines	$4.725
Minneapolis, St. Paul	3.375
Milwaukee	0.89
Moline, Ill.	1.89
Omaha	6.07
St. Louis	2.725
Ironton and Jackson, O., to:	
Chicago	$5.32
Cincinnati	2.52
Cleveland	3.36
Detroit	3.64
Indianapolis	3.22
Minneapolis, St. Paul	8.40

FINISHED MATERIAL

Pittsburgh, carloads, per 100 lbs., to:	
New York	$0.38
Philadelphia	0.35
Boston	0.415
Buffalo	0.295
Baltimore	0.335
Cleveland	0.24
Cincinnati	0.32
Chicago	0.38
Detroit	0.32
Minneapolis and St. Paul	0.66
Denver	1.32
St. Louis	0.475
New Orleans	0.515
Birmingham	0.765
Pacific coast (all rail)	1.665
Pacific coast (tin plate)	1.665

Bands, New York	4.28c to 4.33c
Bands, Boston	4.58c
Bands, Detroit	4.13c
Bands, Buffalo	5.30c
Bands, San Francisco	5.80c
Hoops, Buffalo	4.20c
Hoops, Boston	5.00c
Hoops, New York	4.58c
Hoops, Detroit	4.13c
Cold rolled shafting, Buffalo	5.25c
Cold rolled shafting, N. Y.	5.50c to 5.65c
Cold rolled shafting, Boston	5.25c
Cold rolled shafting, San Fran.	7.25c
Cold rolled flats, squares and hexagons, New York	6.00c to 6.15c
Cold rolled rounds, Detroit	5.00c

Tubular Goods

Pittsburgh basing discounts to jobbers in carloads

Steel Pipe

STANDARD WEIGHT

Butt Weld	Black	Galvanized
⅛, ¼ and ⅜-inch	50½	24
½-inch	54½	40
¾ to 3-inch	57½	44
Lap Weld		
2-inch	50½	38
2½ to 6-inch	53½	41
7 to 12-inch	50½	37
13 to 14-inch	41	
15-inch	38½	

PLUGGED AND REAMED

Butt Weld		
1 to 3-inch	55½	42
Lap Weld		
2-inch	48½	36
2½ to 6-inch	51½	39

EXTRA STRONG PLAIN ENDS

Butt Weld		
⅛, ¼ and ⅜-inch	46½	29
½-inch	51½	39
¾ to 1½-inch	55½	43
2 to 3-inch	56½	44
Lap Weld		
2-inch	48½	37
2½ to 4-inch	51½	40
4½ to 6-inch	50½	39
7 to 8-inch	46½	33
9 to 12-inch	41½	28

DOUBLE EXTRA STRONG PLAIN

Butt Weld		
½-inch	42½	32
¾ to 1½-inch	45½	35
2 to 2½-inch	47½	37
Lap Weld		
2-inch	40½	31
2½ to 4-inch	42½	33
4½ to 6-inch	41½	32
7 to 8-inch	36½	23

Wrought Iron Pipe

Pittsburgh basing discounts to jobbers in carloads.

THREADS AND COUPLINGS

	Black	Galvanized
¼-inch	+ 9	+ 35
⅜-inch	15½ to 25½	1½ to 11½
½-inch	19½ to 29½	1½ to 11½
¾ to 1½-inch	24½ to 34½	8 to 18½
Lap Weld		
2-inch	20½ to 28½	6½ to 14½
2½ to 6-inch	22½ to 30½	9½ to 17½
7 to 12-inch	19½ to 27½	6½ to 14½

PLUGGED AND REAMED

Two points less than above

EXTRA STRONG PLAIN ENDS

Butt Weld	Black	Galvanized
¼-inch	+ 9	+ 35
⅜-inch	13½ to 23½	6½ to +3½
½-inch	18½ to 28½	5½ to 15½
¾ to 1½-inch	24½ to 34½	9½ to 19½
Lap Weld		
2-inch	21½ to 29½	8½ to 16½
2½ to 4-inch	23½ to 31½	11½ to 19½
4½ to 6-inch	22½ to 30½	10½ to 18½
7 and 8-inch	14½ to 22½	2½ to 10½
9 and 12-inch	9½ to 17½	5½ to +2½

DOUBLE EXTRA STRONG, PLAIN ENDS

Butt Weld	Black	Galvanized
½-inch	15½ to +39½	3½ to +51½
¾-inch	20½ to +22½	8½ to +34½
1-inch	+38½	+50½
1¼-inch	+22½	+34½
1½-inch	+21½	+33½
Lap Weld		
2-inch	16½ to + 7½	4½ to +10½
2½ to 4-inch	18½ to + 7½	4½ to +10½

Boiler Tubes

STEEL

1¾ and 2-inch	19½
2¼-inch	24
2½ to 3¼-inch	30½
3½ to 4½-inch	40½

IRON

1¾-inch	+10
2-inch	List
2¼-inch	2
2½ and 2¾-inch	6
3 and 3¼-inch	7
3½ to 4½-inch	12

FINANCE AND ECONOMICS

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IRON TRADE

RAIL BUYING DISAPPOINTING

Independents Cut Open Hearth Rails to Steel Corporation's $47 Price.

CLEVELAND, Dec. 22.—The Iron Trade Review today says:

Announcements of wage reductions which promise to spread, and the closing of many plants for an indefinite period over the holidays, mark a new and advanced stage in the liquidation process in iron and steel. The wage cuts of 20 to 35 per cent posted by some independent mills and merchant blast furnaces and dupli-

400 Newspapers Regularly Quote

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CLEVELAND

The international reputation and the World-wide circulation of THE IRON TRADE REVIEW is the result of year after year of unfailing Editorial accuracy and reliability.

PROOF—

THE IRON TRADE REVIEW

"The Most Widely Quoted Trade Paper In The World"

New Trade Publications

RIVET SETS—The Cleveland Punch & Shear Works Co., Cleveland, is circulating a 4-page folder in which data pertaining to rivet sets and rivet set blanks are given.

HEAT TREATMENT—A 30-page illustrated booklet is being circulated by the Griscom-Russell Co., New York, containing an article, "The Cooling of Quenching Oil in the Heat Treatment of Steel," by Kenneth B. Millett. The back part of the booklet contains line drawings of oil cooling equipment, etc., as described in the article.

COMPRESSORS—The Chicago Pneumatic Tool Co., New York, is circulating a 32-page illustrated booklet in which oil engine driven compressors are described and illustrated. The equipment is described in detail, such information as fuel requirements, general details of construction and similar data being given. Specifications are also given.

BALING PRESSES—The Chicago Baling Press Mfg. Co., Chicago, has issued a catalog featuring the advantages of sorting and compressing scrap material that they may be sold to consumers to better advantage. The entire line of presses for various purposes is illustrated and much information is imparted as to results. The catalog also shows a line of paper balers.

SAND TEMPERING — The American Foundry Equipment Co., New York, is circulating a 20-page illustrated booklet in which the use of a sand cutting machine in malleable foundries is described and illustrated. The booklet gives data on operations of such equipment in a number of large malleable foundries, including that of the Chain Belt Co., Milwaukee. The illustrations show the machine at work.

TANDEM PRESS—A circular of 12 pages is being circulated by the Baird Machine Co., Bridgeport, Conn., in which a double action tandem press is described and illustrated. According to the booklet, this press, when equipped with simple tools, automatically will feed the metal to the front press, pierce, stamp, letter or do any follow-up work, blank, hold down the blank and draw, then transfer to the back press and redraw, pierce, form, stamp or perform any operation that might be carried out in a single action press.

CRAWLER CRANES—Victor R. Browning, Cleveland, has published a 32-page illustrated booklet which describes locomotive cranes equipped with crawler belt, which presents a smooth track over which the body of the crane travels. The crawler belt is composed of individual pads constructed of armor plated wooden blocks, or entirely of steel, so arranged that the pull or driving power is equalized throughout the entire machine, at the same time distributing the weight of the whole over a considerable amount of the surface. Other details are given.

SPECIAL MACHINERY — The Howard Iron Works, Buffalo, is circulating a 56-page illustrated booklet in which bolt, nut and special machinery is described and illustrated. This equipment includes a semiautomatic nut burring machine, hot pressed nut machines, semiautomatic nut tapper, bolt headers, continuous heading and forging machines, nut burring machines, bar heating furnaces, heading and forging machine furnaces, forges, heavy double-head facing and boring machines, carbon electrode molds, metal goods pickling and washing machines, etc. Details are given in full including specifications, etc.

COMBUSTION CONTROL.—A 28-page booklet on heavily coated stock with stippled cover in water color reproduction has just been issued by the Automatic Fuel Saving Co., Chicago, setting forth details of a system for economical boiler plant operation. Due to increased cost of coal and labor, demand for a controlling device which will decrease the consumption of the former by eliminating waste and lessen the burden on the latter has resulted in devices to work automatically in boiler furnaces. The system described has been devised to decrease dependence on the human element and to cause any change in conditions of combustion to correct automatically the waste which otherwise would result. To obtain this end three elements are considered, boiler damper, air supply and stoker speed, each being controlled by diaphragms operated by compressed air. By this means, when steam pressure goes below the desired point, the decreased pressure results in causing a higher combustion rate by opening the boiler damper and speeding up the stoker. This immediately brings back the steam pressure. The text is clearly illustrated by half tones and diagrams and by views of numerous large plants in which this system of control is in use.

(*Concluded from page* 589)

Business in Canada

A. A. McIntyre is chairman of the board of control.

TORONTO, ONT.—The A. W. Cash Co., Ltd., has been incorporated to manufacture iron, steel, metals, forgings, castings, etc, with $50,000 capital stock, by James L. Ross, Arthur W. Holmested, Arthur B. Mortimer and others.

TORONTO, ONT.—The Siche Gas Range & Heat Co., Ltd, has been incorporated to manufacture heaters, ranges, stoves, boilers, etc., with $60,000 capital stock, by Frank J. Hughes, Leo J. Phelan, Daniel P. J. Kelly and others all of Toronto.

TORONTO, ONT.—The Thermoflash, Ltd., has been incorporated to manufacture heating apparatus and controllers for gas and other heaters, machinery, etc., with $1,000,000 capital stock, by George H. Sedgewick, James Aitchison, Vernon O. Matchett and others.

Business Changes Announced Recently by the Trade

NEW YORK offices have been opened at 21 East Fortieth street, by the F. J. Ryan & Co., Philadelphia specialists in electric heating problems in both the chemical and metallurgical industry. The new office is under the supervision of E. C. Melby, who for a number of years was a figure in the export trade, specializing in Scandanavian countries.

* * *

The name of the Pennsylvania Furnace & Stove Co., Warren, Pa., has been changed to the Pennsylvania Furnace & Iron Co.

* * *

The Wright Carriage Body Co., Moline, Ill., manufacturer of automobile bodies, recently changed its name to the Moline Body Corp.

* * *

Offices have been opened at 520 Walnut street, Philadelphia, by the Celluloid Zapon Co., New York. The new office is in charge of B. O. Clausen.

* * *

Van Vechten & Son, mill supplies, pipe valves and fittings, 18 Warren street, New York, have been appointed representatives of the Hershey Machine & Foundry Co., Manheim, Pa., for cast iron companion flanges in New York and vicinity.

* * *

The Chicago Flexible Shaft Co. has opened an office in Detroit for the distribution of furnaces and to give the benefit of its service and counsel in heat treating problems to customers in this section of the country. The new office, which is at 601 Kerr building, is in charge of George P. Beck.

* * *

In order to meet an increased demand for its products the Scientific Apparatus Co., Inc., New York, has found it necessary to increase its facilities and move to larger quarters. It has moved to a new building at 95 River street, Hoboken, N. J., from 162 West Thirty-fourth street, New York, where its research and experimental departments are housed under the same roof with its manufacturing plant.